The American City

DECEMBER 1959

Philadelphia expressway traffic rides on Texaco Sheet Asphalt

Laying the hot-mix Texaco Sheet Asphalt wearing surface on Philadelphia's Vine Street Extension, an important link in the new Interstate Highway System.

General Contractor: LIPSETT, INC.

Asphalt Contractor: UNION PAVING COMPANY

The Vine Street Extension is the newest link in the system of modern expressways, which expedite the flow of Philadelphia's heavy traffic.

For important urban traffic arteries such as this, the plant-mixed Texaco Sheet Asphalt pavement constructed on the Vine Street Extension has many advantages. In addition to rugged durability and low upkeep cost, it is unequalled for driving comfort. Traffic lines stand out sharply against its dark, glare-free surface. It is immune to chemicals used to melt ice and snow.

Vine Street Extension is part of the new Interstate Highway System. The choice of heavy-duty Asphalt paving for urban, as well as rural, portions of this system results in substantial savings to the road builder and to the taxpayer.

Helpful information for city officials on all types of Asphalt construction for streets, airports and parking areas is supplied in two free Texaco brochures. Write our nearest office for copies. No obligation.

TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 1 Minneapolis 3 Philadelphia 2 Richmond 25

TEXACO

TEXACO ASPHALT

The American City

DECEMBER 1959

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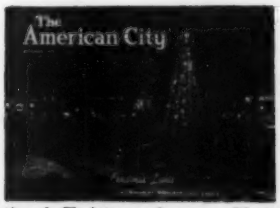

COVER PICTURE

Shaker Heights, Ohio, near Cleveland, provides the scene for this month's cover illustration. The warm, friendly setting of the Christmas display is Shaker Square, a shopping area in which merchants co-operated to integrate their own displays with traditional Christmas themes. Photo, courtesy of General Electric Company, Lamp Division, Nela Park, Ohio.

A Buttenheim Publication

▲ A kitchen phone that can be recessed in a wall or cabinet.

▲ A phone that has push buttons instead of a dial for calling.

▼ A phone with the dial conveniently placed in the handset.

▼ A compact microphone-dial unit for "hands-free" telephoning.

TOMORROW'S TELEPHONES ?

They're being tested today!

These are models of some new and different telephones that we're testing in the homes of certain of our customers. We want to discover what the customers themselves find most useful and attractive about these phones, and what changes could be made to improve them.

Exciting in themselves, these new telephones are also symbols of many exciting changes going on "behind the scenes" to make the telephone still more useful and convenient. (For example, millions of our customers can now dial their own long distance calls direct.)

Some day you may have one or more of these phones in your home. But even if these experimental models are never put into full production, the research and technical skills that went into them will be used in other ways, to bring you continually improving telephone service.

BELL TELEPHONE SYSTEM

Volume 74 Number 12

The American City

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ASSOCIATED PUBLICATIONS

Contractors and Engineers	MART	The School Executive
Municipal Index	EDUCATIONAL BUSINESS	AMERICAN SCHOOL AND UNIVERSITY

LETTERS TO THE EDITOR

American City Style For Annual Report

One of the constant plagues of city managers is the presentation of an annual report. I believe that such a report must be presented to attract local attention and make people want to read it, if it is to accomplish its purpose. As you know, many such reports are dull, uninteresting and virtually worthless.

I have proposed an Annual Report, for 1959-60, of 32 pages, to be an exact copy of THE AMERICAN CITY. Our cover to be in color, as yours is, and the makeup in general a duplication of your publication, if we may have your permission to do so.

Ours is a small community (pop. 3,889) and we propose to print approximately 1,500 copies, for local distribution. Limited advertising to local concerns will make the report possible at no expense to the taxpayers. I feel that we can make this one of the finest Annual Reports in the country, for a small community. Your permission is all that we need.

RICHARD BARTON
City Manager
Kingstree, S. C.

EDITOR'S NOTE: Permission gladly granted.

Ground Garbage Is No Trouble

Mr. Ritchie's article "Ground Garbage Won't Trouble This Plant" (November 1959, p. 98), strikes a familiar chord. We have a sewage purification plant facing very much the same problem confronting Lincoln, Ill. We haven't had any trouble either. In fact, we haven't had the trouble that Mr. Ritchie is so concerned about encountering in the Lincoln plant.

Mr. Ritchie seems worried about grease. Experience here has shown there is not the grease problem with ground garbage that you would expect. The waste from the Richmond State Hospital which is ground here at the plant is much lower in solids content than that which is received from residential areas.

The article states that grease can be removed by the Vacuator and transferred to the digesters. With all the trouble arising from digester scum it would seem highly desirable to have alternate means of grease disposal. There have been several fixed-cover digesters in other plants that have been so stressed by scum that the columns supporting the roof and the seal between the roof and wall have been broken.

The digesters at the Richmond Plant were designed for ten cubic feet per capita and we are very glad to have this much capacity. Because of the installation of home grinders the amount of garbage that is collected and ground has not risen in proportion to the increase in population but the loadings on the rest of the plant have increased materially.

There can be no fault found with the designer's effort to secure good grit removal. The larger the amount of ground garbage introduced into the sewer system the more troubsome the grit problem becomes.

In the central grinding operation at the Richmond Plant the amount of grit consisting of bone chips, coffee grounds, egg shells and metal runs about 30 to 40 pounds per ton of raw garbage ground. From the comments of other plant operators it would seem a word of warning might be in order and it would be well to watch for grit collections in the aeration unit. It seems grit has a way of getting where it is least expected and can become most troublesome.

WM. EDWIN ROSS,
Superintendent
Richmond (Ind.)
Sanitary District

Sewage Lagoons

The story, "Can You Use A Sewage Lagoon" by Mr. L. E. Webber (November 1959, p. 175), should be of interest to many small municipalities. A number of such communities in Missouri are utilizing lagoons to treat sewage. Most of our lagoons in Missouri have caused less odor than conventional treatment plants.

We have 171 of these lagoons in Missouri. Of these, municipalities operate 74; tourist and trailer courts, 44; schools, slaughter houses, cafes, and similar places, account for the balance.

We have had some difficulty with odors in two of our larger lagoons,

(Continued on page 18)

How a John Deere Loader kept this job on schedule for Denver Mountain Parks

As part of an over-all improvement at Denver's famous Red Rocks natural amphitheatre, plans called for a very narrow inclined pedestrian tunnel to be cut through 100 feet of red Colorado sandstone, directly under the front rows of seats.

After an attempt with pick-and-shovel labor, a John Deere "440" Diesel Crawler-Loader was put on the job.

D. R. Dickerson, superintendent, reported, "Thirty minutes work with this loader accomplished as much work as four men could do in four hours. We have found the unit performs well in removing loose stone at the forward wall, in cutting clean sidewalls, and even in cutting down the sandstone overhead.

"For this tight schedule tunnel job, we especially like the unit's combination of size and power. When we are not using the loader in the tunnel we put it to work on general cleanup, where its compact size permits use in confined areas."

Get the impressive facts on the "440" Crawler-Loader first hand. See your John Deere Industrial Dealer for a demonstration, plus details on the John Deere Credit Plan.

John Deere Industrial Division, Dept. 1933, Moline, Illinois.

JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*

EDITORIAL

"—that we may share the gift of good will"

The Christmas season is a period of thanksgiving, joy, gratitude and reverence. It also is a period of some danger—danger that the thanksgiving become superficial; the joy, commercial; the gratitude, insincere; and the reverence, perfunctory.

To those privileged to carry the great responsibility of local self-government, this month has even deeper significance. Regardless of creed, all are reminded by this season of their special obligation to express love for and respect of their fellow man. The privilege of living under a government that gains its power through the consent of the governed is great—one that is not enjoyed universally and one that must be protected.

The spirit of this season asks for understanding, forgiveness, tolerance. For these, the nation asks for and can count on receiving leadership from its local governments. Typical of this leadership is the statement of one able city administrator, "We always make it a point to shake hands after every meeting." Harry Golden, in his warm-hearted little book, "Only in America," expressed bewilderment that two candidates for office could oppose each other so strongly and yet, after the election, bury their differences sufficiently to join each other socially. This, too, is America, and bespeaks the understanding and forbearance that this season tries to teach.

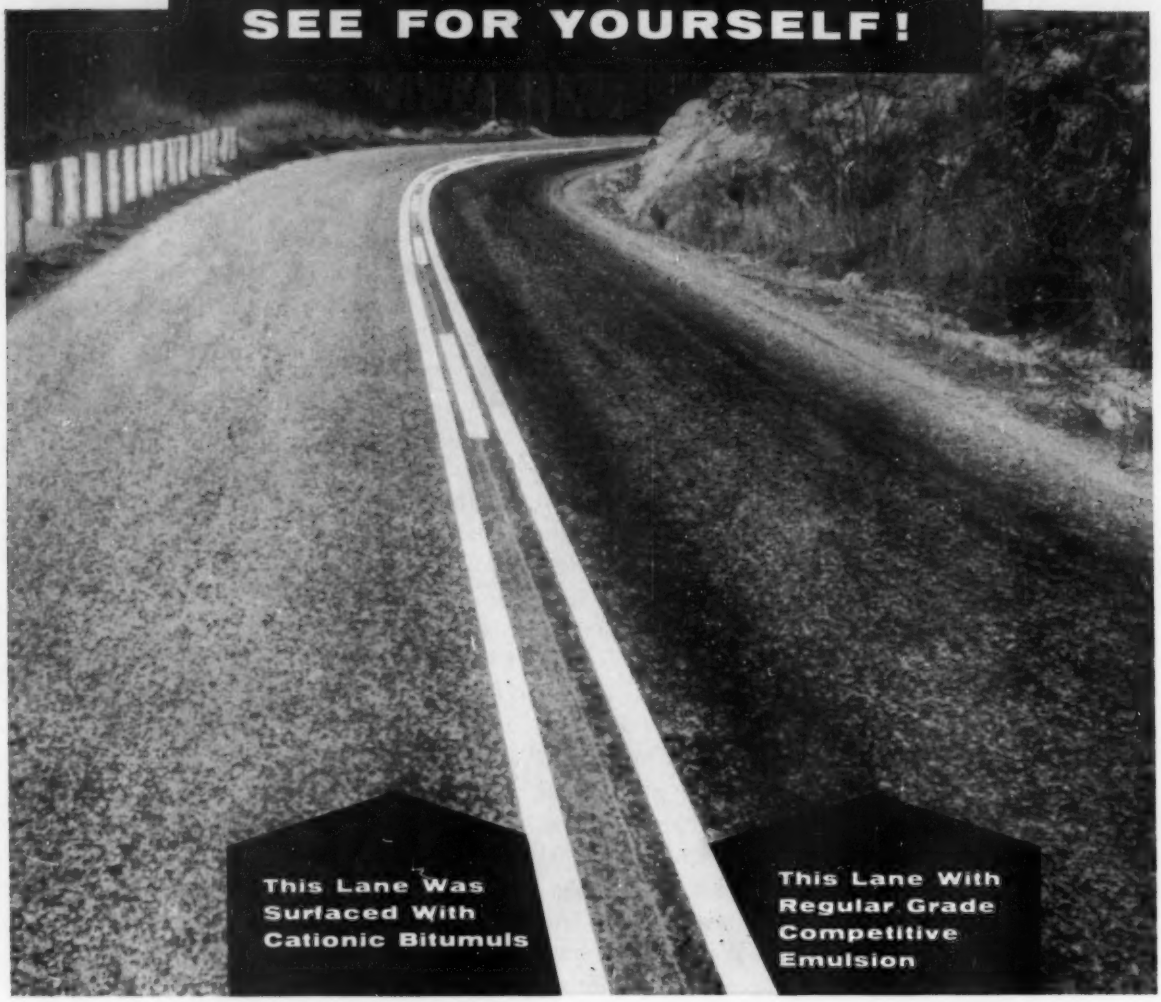
We are a nation of 180 million. On the other side of the globe is a nation of 200 million whose leader has publicly stated that he intends to bury us. Still further away is another nation of 600 million whose hostility to our way of life reaches almost hysterical heights. Thus, roughly one-third of the world's population recognizes, as its basic competitor, the 180 million people of this country; and are dedicated to the goal that would make the Communist Manifesto prevail over the Bill of Rights in our own Constitution.

At one time it was said that "If Paris has a cold, Europe sneezes." Today, one also can say that if in America, faith in the great privilege of democracy and in the rights of the individual ebbs, then the lights of freedom dim throughout the world. Among the very front-line defenders of these freedoms shall be the leaders of America's local governments.

In this festive holiday season, we give thanks that we enjoy the privilege of living within the democratic framework of a free society; and we turn to those great hopes that the spiritual leaders have endeavored for so long to teach us . . .

. . . that on this earth, we may enjoy the blessing of peace; and that among all men, we may share the gift of good will.

SEE FOR YOURSELF!



You Get BETTER Surface Treatments With CATIONIC BITUMULS

This photograph gives visible proof of the superior performance of Cationic Bitumuls. The picture was taken on a 25-mile test section of highway in North Carolina.

Based on the success of this job, Cationic Bitumuls is being used for extensive surface treatment work throughout the State during the current construction season.

In every test made to date—whether in laboratory or field—Cationic Bitumuls has shown two outstanding qualities:

1. Unusual ability to hold aggregate, even "difficult" types.
2. Rapid initial set that minimizes damage from early rainfall.

If you haven't tried this new material, call our nearest office today and arrange to test Cationic Bitumuls on your next pavement construction or maintenance job.

American Bitumuls & Asphalt Company

320 MARKET STREET • SAN FRANCISCO 20, CALIFORNIA

Atlanta 8, Ga. Portland 8, Ore. Perth Amboy, N. J. Mobile, Ala. Oakland 1, Calif. Baltimore 3, Md.
St. Louis 17, Mo. Inglewood, Calif. Cincinnati 38, Ohio Tucson, Ariz. San Juan 23, Puerto Rico

BITUMULS® Emulsified Asphalts • CHEVRON® Paving Asphalts • LAYKOLD® Asphalt Specialties • PETROLASTIC® Industrial Asphalts

Pavement Cut Repairs In Midland, Texas

A good street can be ruined by a poorly repaired pavement cut. Consequently, Midland gives special attention to this important phase of street maintenance work.

Our general procedure is this: After the water or sewer main has been laid in the ditch, the dirt fill is compacted as it is put back in the trench. We attempt to maintain optimum moisture content as the fill is brought up to grade. We then place a caliche base on the fill, again trying to maintain optimum moisture content for maximum compaction.

Further Compaction

These two fills are allowed to set several days under traffic conditions to provide further compaction. The caliche base is then excavated to a depth of about 1½ inches and the surface primed with an emulsified asphalt. This is allowed to cure for several days. We then move back on location to apply the asphalt overlay.

Equipment used in this work consists of a Barber-Greene Mix-all portable asphalt plant, a trailer type Grace asphalt distributor and heater, and a Rosco Mfg. Co. Vibrapac roller. The mobility of this equipment provides for easy moves from job to job.

The work is done under the supervision of Street Superintendent G. W. Williams and Claude Mabry, foreman of the patching crew.

K. E. McFarland
Planning Director
Midland, Texas

Editor's Note: Mr. McFarland was formerly Director of Public Works for the City of Midland, Texas.

After the trench is filled and compacted the surface is primed and a hot-mix asphalt surface course applied.

A vibrating roller compacts the asphalt overlay; proper compaction is basic, from fill right on to overlay.

The completed patch is smooth and blends well with the rest of the pavement.

Urban Streets Deserve More Tax Funds

Another justification for giving urban streets a bigger slice of motor vehicle tax funds appeared in a recent fact sheet issued by the U. S. Department of Commerce, Bureau of Public Roads (Revised Table VM-1).

The bureau records that in 1957, motor-vehicle travel amounted to 647 billion vehicle miles. Of this the largest portion was on urban streets, which in turn has the smallest percentage of the roadway mileage. A breakdown of the figures shows:

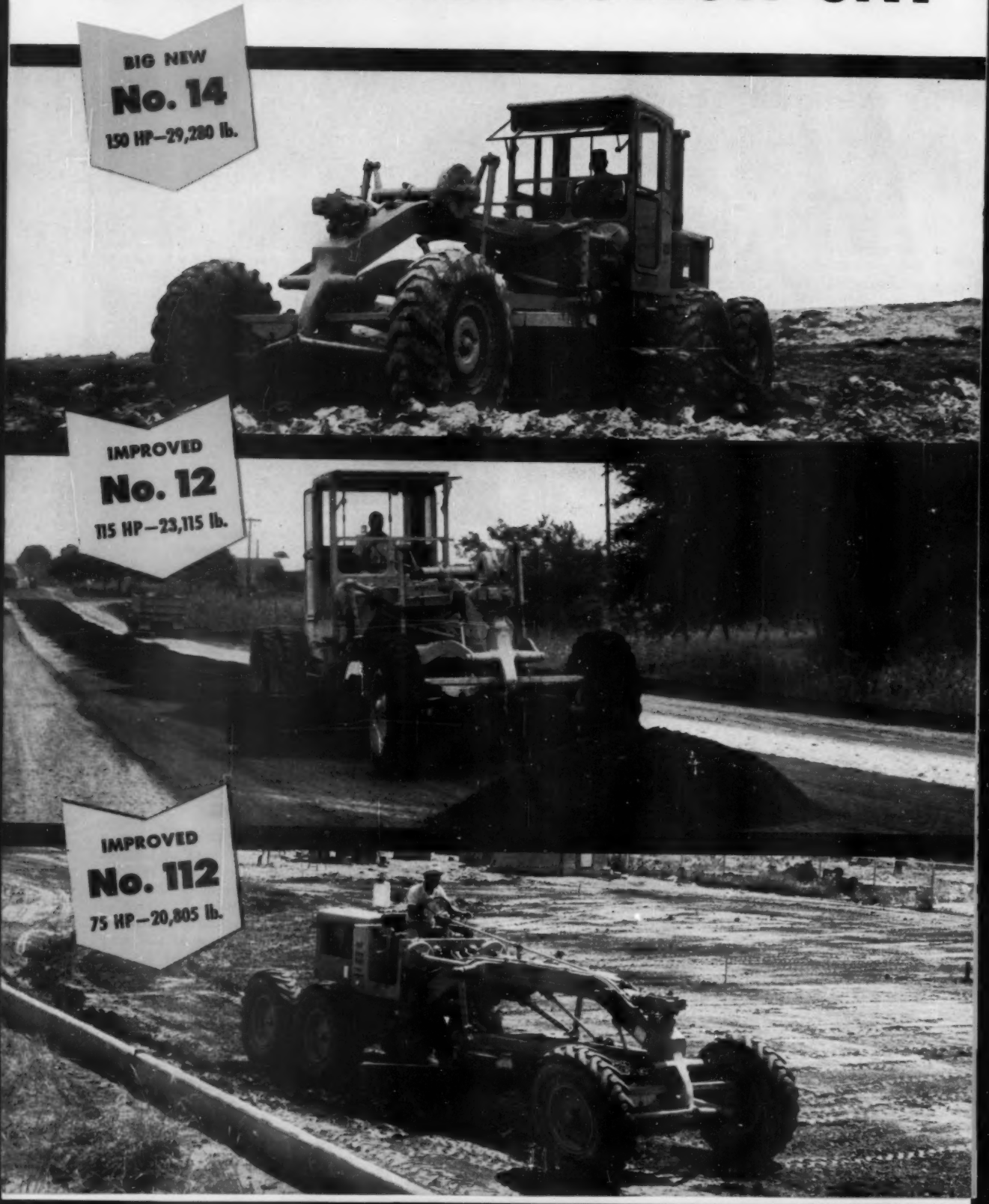
Type of road	% of total motor-vehicle travel	% of total road and street system
Urban streets	46	11
Main rural roads	40	16
Local rural roads	14	73

Since the gas tax and other vehicle fees are a reflection of the use made of the road and street system, this means that urban streets were responsible for earning the greatest portion of these tax funds, but had to do it on the smallest portion of the road and street system. It also indicates why the urban street system is so badly congested and why more of these funds should be earmarked for enlarging and improving this system.

The Bureau of Public Roads estimates that the 1958 total travel will have shown a peak of 665 billion vehicle miles; and the 1959 figures will hit nearly 700 billion.

The new travel data, based on studies made by the states for the Bureau's highway cost allocation study, provides a more reliable base for estimating.

3 HIGH-PRODUCTION CAT



MOTOR GRADERS...to fit any job!

HERE THEY ARE—Caterpillar's three modern, heavy-duty Motor Graders. Each is designed to outwork any machine of comparable size. Each is ruggedly built to deliver unequaled availability under the toughest conditions. Pick the one that meets your job needs—and you can count on it to do a whale of a job for you.

The No. 14, the industry's first and only Turbocharged Motor Grader, is the most versatile BIG grader ever developed. It operates at the highest practical working speeds with either a 12-foot or 14-foot moldboard. Built to handle the biggest jobs, it will deliver profitably for you on many applications. For example:

1. Power Applications like heavy grading, heavy ditching, rough grading and bank sloping.

2. Control Applications like light spreading, surface maintenance, fine grading and light blading.

The No. 12, known for more than 20 years as the "standard of the industry," has recently been improved to increase its superiority over similar-size graders. Here are some improvements that contribute to its greater capacity:

1. Clearance between the top edge of the blade and bottom edge of the circle has been increased to provide improved rolling action, allow more material to move across the blade.

2. Blade Thickness has been increased and blade beams have been increased in length and thickness to handle heavier loads.

3. New Mechanical Controls for reduced kickback, easier engagement.

4. New Blade Controls feature a positive mechanical lock—exclusive with Caterpillar. When control is in neutral, the power shaft is locked by a set of gear teeth to prevent creeping.

The No. 112 has also been improved recently—including the new blade controls mentioned above. Use the No. 112 on smaller jobs—none can touch it for efficient performance!

These are just some of many features that put Cat Motor Graders out front with higher production at lower operating cost. For the complete picture, see your Caterpillar Dealer. Ask him to demonstrate—just say when and where, he'll be there!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

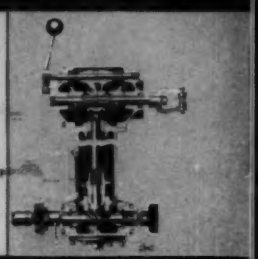
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

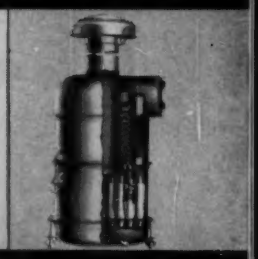
BEST BUY FOR YOUR TAX DOLLARS

HIGH-PRODUCTION FEATURES OF CAT MOTOR GRADERS!

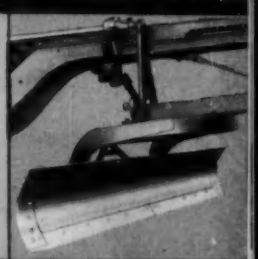
PRECO AUTOMATIC BLADE CONTROL Optional. Exclusive for Caterpillar Graders, improves performance on a wide range of applications. Operator selects desired slope on dial. Now transistorized for freedom from maintenance and adjustment, the unit automatically maintains blade slope within ½ inch in 10 feet.



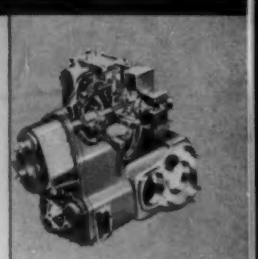
MECHANICAL BLADE CONTROLS Standard. Exclusive, new Caterpillar mechanical blade controls ease engagement, provide precise blade adjustment and reduce kickback. "Anti-creep" lock makes blade stay put under load. Another plus: Operator, while seated, has unobstructed view of job.



NEW DRY-TYPE AIR CLEANER Most efficient air cleaner ever developed. Removes 99.8% of all dirt from intake air during every service hour. Can be serviced in five minutes. Cuts maintenance time (by as much as 70%) and substantially reduces costs. Extends engine life.



AMPLE THROAT CLEARANCE New design on the No. 14 and No. 12 permits increased clearance between moldboard and circle for maximum loads. Extra strength is built into frame, drawbar and circle to match engine power, absorb the punishment of rough work and assure accurate blading.



OIL CLUTCH Both the No. 14 and No. 12 are equipped with the most advanced clutch design in the industry—proved by millions of hours of use. Provides up to 2,000 hours' service without adjustment, the equivalent of about 12 months of "adjustment free" operation. Virtually eliminates down time for clutch repair.

NEW CAMPAIGN STARTS COMMITTEES ACROSS

For the first time, a nationally organized plan to develop local action to combat our growing water shortage has been devised by a supplier to the industry. The need for a campaign to stimulate such action was recognized by the Cast Iron Pipe Research Association. Here's how the first year of the campaign was planned—and the successful results it produced.

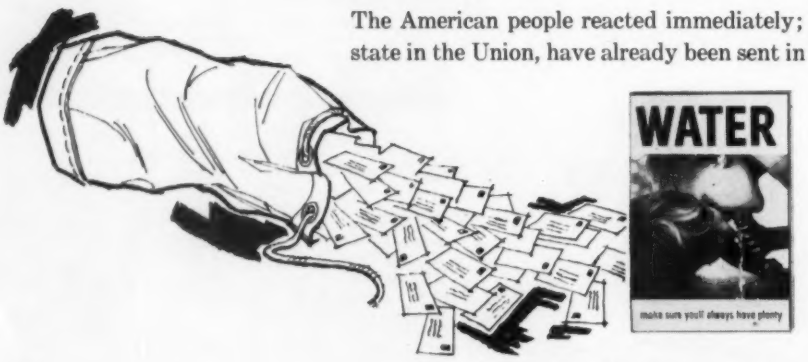
Frank ads warned of shortage

The theme of the ad campaign "What Will You Do Without Water?" was coupled with dramatic photographs of people using water in everyday situations.

Informative booklet told how <u>everyone</u> could help

Each ad offered the booklet "Water—Make Sure You'll Always Have Plenty," which outlined working plans for local action against water problems.

Response was heavy!



The American people reacted immediately; thousands of requests, from every state in the Union, have already been sent in for the booklet—but that's not all!

LOCAL WATER IMPROVEMENT THE COUNTRY!

Research shows people took action!

The average person who wrote in for the booklet did at least three things. For instance:

* He informed neighbors and friends of the problems, discussed solutions, and sought more information.
* He requested a starter kit from Cast Iron Pipe Research Association—to help spur more interest and plan new and better water facilities.
* He formed or joined a local water improvement committee in order to take direct and immediate action.

Here are just a few of the remarks received on the worth and completeness of the program.

From a housewife in Connecticut: *"Although I had no such intentions before, I'm going to do something about the suggestions given."*

From a teacher in the state of Washington: *"Last month I was elected as a trustee for the Local Water User's Corporation. We are now in the process of installing a new water reservoir; your program was a very helpful source of information."*

From a retired man in Florida: *"Our city is talking of putting in a new water supply system in order to tap river water. Your literature has been very useful."*

The American people are interested and willing to face the problem; they need only your guidance.

Now . . . A complete program for you!

A complete portfolio has been compiled for you—to help you stimulate action in your community . . . to help you answer some of your own local water problems. If you are now faced with a local water problem in which community relations will play an important part, write on your letterhead to the Cast Iron Pipe Research Association, 3440 Prudential Plaza, Chicago 1, Ill., Thos. F. Wolfe, Managing Director.

The Cast Iron Pipe Research Association is proud of the job it has done—and looks to the future with confidence that the American people can and will lick the water problem!

CAST IRON PIPE

THE MARK OF THE 100-YEAR PIPE

No. 955 excavates part of a total of 19,000 yd., preparing for base an area 20 ft. wide, 12-13 in. deep. Cuts are made by Cat No. 12 Motor Grader and windrowed. Job is part of a $1,828,366 project by Gulf Bitulithic Co. on U. S. 75, to be part of the Interstate Highway System.

Says Operator F. H. Leggett: "I can move over 100 cu. yd. a day more with the side dump than with other loaders. It doesn't spill dirt because you don't have to jockey for position. A Traxcavator is easy to operate and I'm less tired at night. It's the best on the market."

Weather bad... No. 955 terrific... job on schedule!

The performance and versatility of a Caterpillar No. 955 Traxcavator with Side Dump Bucket was vividly demonstrated on a recent highway project in Texas. What happened is of importance to every municipal and county official concerned with the purchase of equipment.

Bad weather cut work days to 20 per cent during the first six months on a 2½-mile widening job on U.S. 75 at Conroe, Texas. A drag line proved a poor producer in the shallow cut. Switching to a Cat No. 955 Traxcavator with Side Dump Bucket, Gulf Bitulithic Co., Houston, Texas, got the job back on schedule—and kept it there! Five-yd. trucks were loaded in an average time of three minutes; four buckets to the truck.

"We increased production 25 per cent," says Superintendent Thomas "Red" Brown. "I like that Side Dump Bucket. You can't beat it."

In-line loading of trucks with the Side Dump Bucket paid off in less traffic congestion on the busy highway, and it also avoided tearing up the subgrade with twisting and turning.

Side Dump Buckets are available on all three Traxcavators: No. 977 (2¼ cu. yd.), No. 955 (1⅝ cu. yd.), and No. 933 (1⅛ cu. yd.). Other buckets, teeth, 'dozers and forks help make a Traxcavator the most versatile excavator-loader.

More and more municipalities and counties are finding the performance and versatility of Cat-built Traxcavators can save taxpayers' money. Ask your Caterpillar Dealer today to demonstrate on your operation. And remember, his reliable parts and service facilities stand behind your investment.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

YOUR TAXPAYERS GET THEIR MONEY'S WORTH WITH CAT-BUILT MACHINES

The unloading platforms at the tailrace of the power plants in the heart of the city keep hauling distances to a minimum.

The Big Problem Is Ice

In Berlin, N. H., we are accustomed to snow storms that leave from 10 to 30 inches of snow at a time and it is not unusual to get from 75 to 140 inches during a winter season. Because our funds are limited, our equipment is not of the latest vintage. Nevertheless, we have a goodly share of it (38 pieces ranging from utility trucks with salt spreaders to graders and heavy duty trucks) and put it to good use. Manpower consists of the writer, two foremen and 60 men trained in various phases of snow removal and ice control. If necessary, we have an additional 25 trucks available on a rental basis.

As in most cities, our plan of attack consists of first clearing state highway routes through the city, the business section, areas by churches, schools and hospitals, narrow streets and outlying business areas, and finally the residential sections.

When it comes to snow removal, we are fortunate in having three snow unloading platforms near the center of the city. These are located at the tailrace of power plants where water never freezes because of the swift current.

Ice, however, is a real problem. Sleet storms and freezing rains are the chief cause but a sudden temperature drop following a wet snow also causes a serious problem. This we attack with a grader, salt and small tractors along with Barber-Greene loaders that will load the ice onto our department's trucks. Removing ice in the gutters is especially important to keep the surface-water drainage system open. This seems to be a never-ending problem after a freezing rain storm as water from abutting land runs into streets and freezes.

Use of Salt

We use salt only at temperatures above 15°F, and include sand and grit at the lower temperatures. Since most of our sewers are of the combined type, we use as little sand and grit as possible to keep sewer maintenance at a minimum.

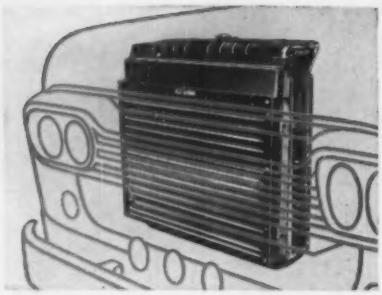
We are responsible for snow and ice control on 74.8 miles of streets. Cost of this work comes to approximately $1,000 per inch of snowfall.

C. J. BRUNGOT
Director of Public Works
Berlin, N. H.

This Snogo clears wet snow from Berlin's main street at the threat of a sudden drop in temperature.

An Austin-Western grader helps to solve Berlin's big problem by removing ice from the streets.

NOW! Certified Durability



CLOSER TEMPERATURE CONTROL obtained with automatic radiator shutters means longer engine life, more efficient operation. Temperature variation between 167° and 187° with shutters as compared to 102° to 181° without shutters was reported and certified in loaded vehicle road tests.

LONGER WIRING HARNESS LIFE is the direct result of Ford's greatly improved electrical wiring system for 1960. Ford's '60 wiring harness and the 1959 wiring harness were subjected to shaker table tests plus constant exposure to oil and water vapors, and temperatures of 200°. Certified test results show a threefold increase in 1960 wiring harness life.

INCREASED FUEL PUMP RELIABILITY is an added benefit from Ford's submerged-type electric fuel pump. Certified results of dynamometer tests showed no vapor lock with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under same conditions.

It's a fact! Numerous reports from high-mileage operators of Super Duty Trucks attest to Ford's outstanding durability. Studies by an independent research firm provide certified proof that these models are even more durable for 1960.

Ford Super Duty Trucks have earned a reputation for exceptional performance and durability since their introduction two years ago. Shop service records of many leading fleets show Super Duty tractors with mileage readings between 150,000 and 250,000 and no repairs other than normal maintenance. Similar testimony to the dependability of these Big V's by other satisfied users is being added each month. Is it any wonder that '59 sales of these units were more than double those of 1958?

And for 1960, the Ford Super Duties offer additional refinements. Bigger optional axles and increased GVW's to permit greater payloads and more profitable operation. Automatic radiator shutters to keep the engine temperatures within the most efficient operating range, improved submerged-type electric fuel pumps to prevent vapor lock, and redesigned wiring for more reliable operation are typical of the improvements to be found in these units.

The changes offered for 1960 were tested and evaluated by a leading research organization. Certified results of the studies by this impartial firm (name available on request) provide proof that Ford's Super Duty Trucks are even more dependable.

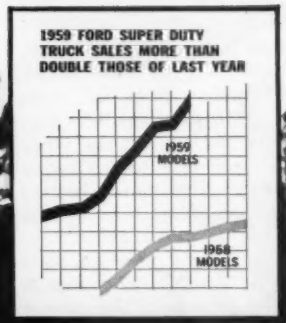
- **Certified Durability through closer temperature control!** Independent research engineers certify that Ford's thermostatically controlled radiator shutters kept water temperature between 167° and 187° in severe mountain grade operation. The test truck with shutters blocked open under same operating conditions had a temperature range from 102° to 181°. The temperature variation of only 20° with shutters means less expansion and contraction in block and heads. Higher, more constant temperatures permit oil to circulate more freely, reducing internal friction. All these factors contribute to longer engine life.

- **Certified Reliability with longer-lived electrical system!** Thicker insulation on wires resists deterioration by heat, oil and gasoline. Asphalt-impregnated loom and plastic-coated mounting clips protect against abrasion. Certified results prove that the 1960 wiring harness has three times longer life.

- **Certified Reliability with Ford's submerged-type electric fuel pump!** Dynamometer tests of engines with submerged-type electric fuel pump and conventional mechanical type showed that vapor lock was non-existent with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical pump resulted in a power loss of 9% at an underhood temperature of 200°.

Endurance tests were run on alternators, two-speed axle speedometer adapters and other related components with similar results. Get all the facts at your Ford Dealer's now!

in Ford Super Duties!



"Our first Ford C-1000 tractor has logged 190,000 trouble-free miles since March of '58,"

says Robey W. Estes, Vice President and General Manager of Estes Express Lines, Richmond, Va. "We haven't had a single road failure and we only bring it into the shop for regular preventive maintenance work once a month.

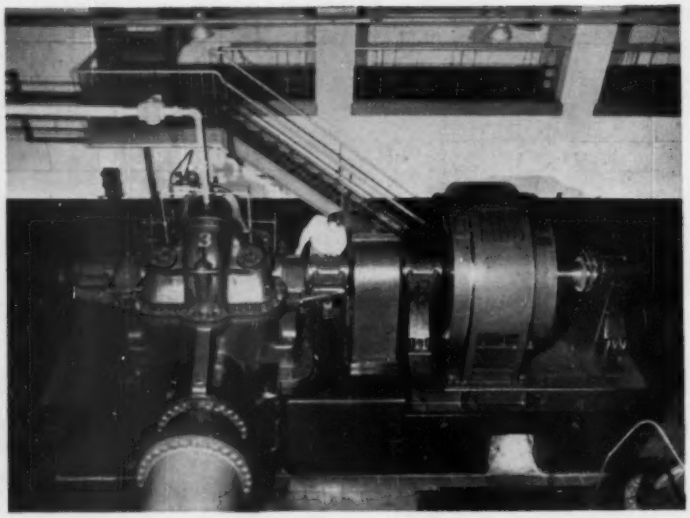
"We use the 477 engine and find oil consumption is exceedingly low . . . only one or two quarts added between 3000-mile oil changes. Engine compression at 190,000 miles is still high and fairly equal and our drivers say that power and pep are at about the same level as when the truck had been run only 60,000 miles.

"We are grossing between 52 and 56,800 pounds with our Ford Tilts. They are giving about the same gas economy and better oil mileage than other makes in our fleet. We bought our fourth Ford C-1000 tractor last month and hope to add more soon."

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

A case for F-M Split-Case Centrifugals!



Typical installation in Toledo averages 80.314% wire-to-water efficiency for year!

Exceptionally high and dependable efficiency with steady, low-cost operation year after year—that's the report from a host of municipalities and industries using Fairbanks-Morse pumps in their pumping stations.

Why? Ask stations like Collins Park High Service in Toledo, O., where five Fairbanks-Morse 36-in. Split-Case Centrifugal Pumps have been giving superb performance for 17 years. The No. 3 pump in the photo pumped 6,065,590,000 gallons in one year alone, handling 26.13 percent of the plant total, and consuming just 3.55 kilowatts hours per million foot gallons!

Your Fairbanks-Morse Field Engineer welcomes you to inspect many other reports like this from his files—reports revealing why no other manufacturer can match the experience of Fairbanks-Morse in providing pumps and drivers for both municipality and industry. Your F-M Field Engineer will be glad to work with your own engineers in selecting the best equipment for your specific requirements. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

See Sweet's Product Design Catalog File for complete F-M Pump Line.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • ELECTRIC MOTORS • DIESEL, DUAL FUEL AND GAS ENGINES
LOCOMOTIVES • COMPRESSORS • GENERATORS • MAGNETOS • HOME WATER SYSTEMS

(Continued from page 5)

both over 40 acres. We believe that the location of one of these lagoons in a valley, which prevents wave action from the wind, may have some bearing on this odor problem. The city has purchased a motor boat which is used, both to distribute the solids which pile up around the intake and to stir up the lagoon by agitation and wave action. I rode in this boat one morning and even wtih the wave action and the agitation from the boat there was little disagreeable odor.

We believe the odor in the other lagoon has been due to the decay of blue-green algae on the bottom of the lagoon. Treating of the logoon with Phygon has helped.

Lagoons are being used successfully for a number of unusual operations in Missouri. The newest is for hog feeding operations. The latest installation, designed to serve a maximum of 200 hogs, covers 3,000 square feet and will be operated at a depth of 2½ to 3 feet. This lagoon has been working satisfactorily.

JOHN H. MCCUTCHEON, *Director*
Bureau of Engineering
Division of Health
Jefferson City, Mo.

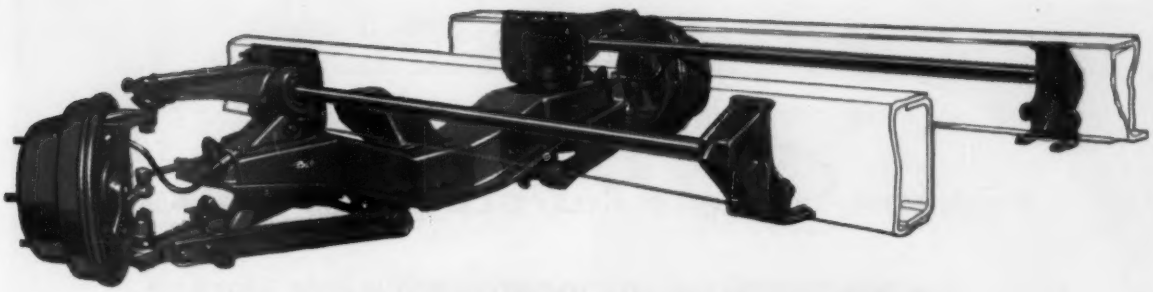
City-School Planning

We believe that members of this Federation would be considerably interested in the articles concerning school planning noted in two issues of your publication. For that reason we ask your permission to reprint "Cooperative City-School Planning Pays Off" which appeared in the August 1959 edition, an article by Temple Jarrell, Director of Parks and Recreation, Fort Lauderdale, Fla., and "School-Park Coordination," by Eldridge Lovelace, Partner, Harland Bartholomew and Associates, in October 1959.

GEORGE E. HAYNES, *Vice-President*
New York State Federation of
Official Planning Organizations
Albany, New York.

1959 Annual Index

Bound into the back section of this issue of "The American City" is the 1959 Annual Index, arranged according to subject and place.



CHEVROLET'S REVOLUTIONARY TORSION-SPRING RIDE

the most significant new truck development in decades!

Years of intensive engineering achieved a revolutionary result—a totally new truck suspension system. The most exhaustive chassis engineering program in trucking history proved conclusively that, from the standpoints of both ride and durability, the finest possible truck suspension system would consist of independently suspended front wheels with torsion bar springing. Advancing on this principle, Chevrolet engineers proceeded through years of development to produce a completely new system for the 1960 Chevrolet truck product.

New Torsion-Spring Ride—how it works. The revolutionary result of Chevy's all-out engineering effort—Torsion-Spring Ride—eliminates both the old-fashioned I-beam front axle and friction-producing front leaf springs. Each front wheel, suspended independently of the other through tough control arms and low-friction linkage, is free to step cleanly over bumps without jarring the entire truck. Also, friction-free torsion bars on either side of the chassis, specially mounted to provide a twisting action, work to absorb each jolt; they flex freely to soak up all kinds of shocks, from the smallest to the most severe.

Three new rear suspensions, tough and tailored to the truck, are completely redesigned to complement the independent front suspension in every weight class.

M70 tandem proves its stamina on year-long test of durability.

Here's a ride that lets you get more work done in a day's time! Take a '60 Chevrolet truck over a rough stretch of back road and feel the absence of I-beam shimmy and wheel fight. Chevy's torsion springs soak up jolts and jars that would shake the headlights off an ordinary I-beam rig. You move along with maximum payloads at higher safe cruising speeds. You make your tough off-the-highway runs in less time, improving your ton-mile-per-hour rate as much as 100%.

A ride that shows respect for the driver and the load! Out at the GM Proving Ground, the test drivers will take a torsion-spring Chevy any day over an I-beam truck—even if they have to drive it twice as far. The ride's that much better; that much safer. The load, too, has an easier time of it. There's far less bounce and jounce, less danger of damaging fragile cargoes.

A ride that adds extra thousands of miles to the truck's working life! You can be sure the shockproof action of Chevrolet torsion-spring ride means lower maintenance costs. As much as 78% of all objectionable road shock and vibration is absorbed before it can be transmitted to the truck's body and sheet metal. Chevy trucks stay new-looking a whole lot longer and their working life is increased by extra thousands of miles.

Once you've experienced the incredible smoothness of a torsion-spring ride, you'll realize that Chevrolet has set off a full-scale revolution with the introduction of its '60 models. By throwing away the old-fashioned I-beam in favor of independent front suspension, Chevy's new design has improved virtually all phases of truck performance. Drive a new one just once. That's all we ask. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

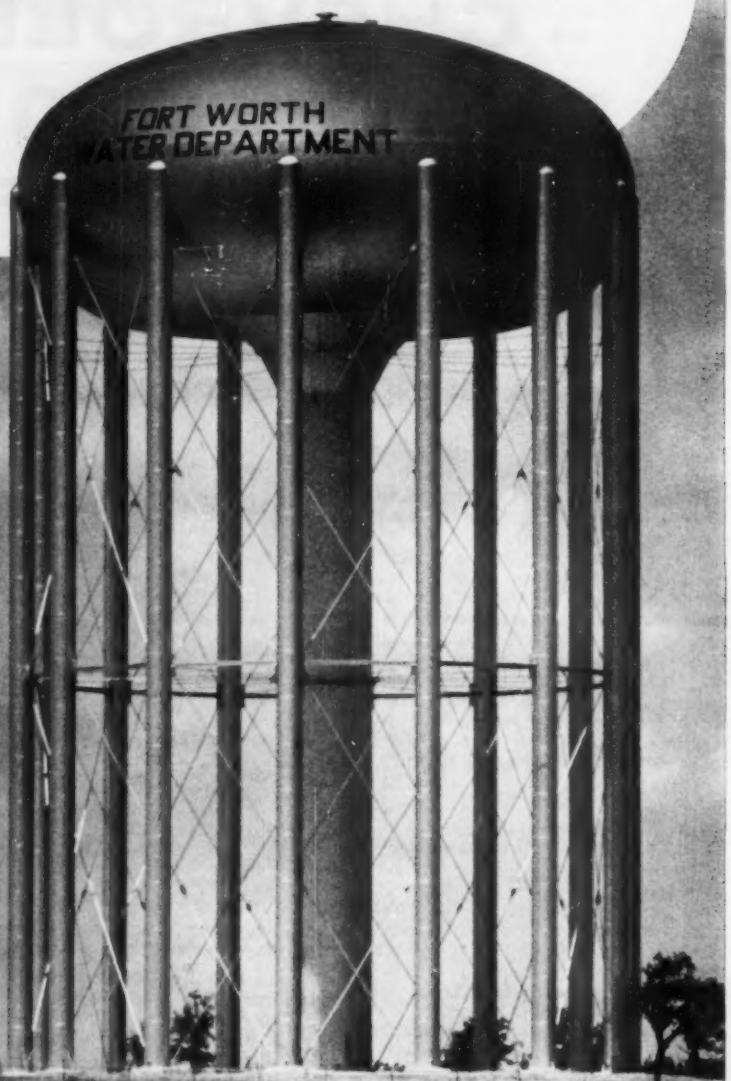
1960 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET

HORTON Spheroidal ELEVATED TANKS

. . . new functional beauty for efficient water storage

by CB&I



This is the striking 2,000,000-gallon Horton Spheroidal elevated water tank built by CB&I for the City of Fort Worth, Texas. It is 105 ft. in dia. and 126 ft. to the bottom.

The new Spheroidal design continues CB&I's tradition of providing graceful, contemporary tanks for America's most progressive communities. Economical, too, because Spheroidals use less steel more effectively. Capacities range from 200,000 to 3,000,000 gallons.

Modern Horton elevated tanks are products of CB&I's *coordinated services*, which form a single source and responsibility for designing, fabrication and erection. The result is *craftsmanship in steel*, skillfully developed over seven decades of experience.

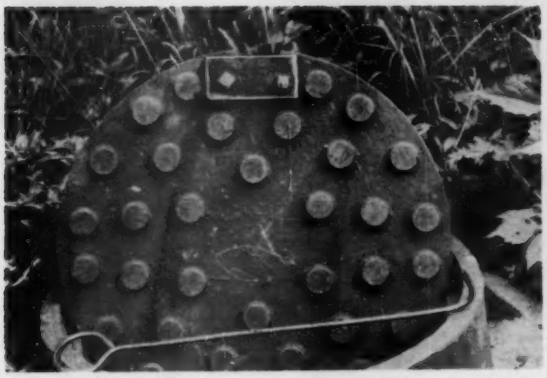
Write for additional details.

CHICAGO BRIDGE & IRON COMPANY

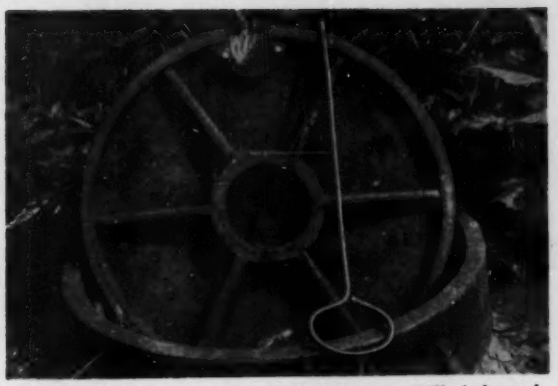
332 SOUTH MICHIGAN AVENUE
CHICAGO 4, ILLINOIS

OFFICES AND SUBSIDIARIES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

M63C



Top view of manhole cover with patch plate. For use on paved streets, the plate is placed underneath covers having indentations instead of knobs.



This under view shows how bolt holes are drilled through the flange on each side of the opening. Each maintenance crew carries a special hook to lift the covers.

Small-Fry Trouble Shooting

A little hometown ingenuity put an end to troublesome vandalism in the sanitary sewers of Barrington, Illinois. Youngsters in a playful mood caused the trouble by dropping sticks, stones, gravel and dirt through the large hand hole on our old-style manhole covers. In several instances at outlying areas they removed the covers and dropped in large rocks and concrete.

Some of the wood floated to the treatment plant and was ground up by the comminutor. However, most of the material settled in the sewer and in some instances produced serious back-ups. Open manholes became a real hazard to children passing by.

After numerous sewer cleaning jobs, the writer got together with Superintendent of Public Works Paul Purcell and a local blacksmith to devise some means of ending these acts of vandalism. Our answer took the form of patch plates placed over the large hand holes.

The patch plate, designed to protect the manhole against insertion of foreign objects, still affords ventilation to the sewer. It consists of a piece of bar iron ⅜-inch thick by 2½ inches wide cut to a length of 5 to 5¼ inches. It is fastened to the cover by means of 7/16-inch-diameter bolts placed through ½-inch-diameter holes drilled through each end of the plate and the flange on each side of the hand hole. The U-shaped hand hole is approximately 2½ inches wide by 2¼ inches deep. We use machine bolts, placing the head on top of the cover. Knicking the thread on each bolt with a chisel prevents the nut from coming loose as a result of temperature changes.

To lift these lids, our maintenance crews use a special hook fashioned from 5/16-inch steel rod. It is about 3 feet long with a 5-inch diameter loop for a handle. The hook is inserted into a ½-inch hole drilled through the manhole lid near the rim.

We did not publicize this project, feeling that it might encourage youngsters to further vandalism. Nevertheless, we have made it much less convenient for them to commit mischief to the sanitary sewers.

JOHN H. D. BLANKE, *Chairman*
Sewerage and Water Committee
Village of Barrington, Ill.

Designing an Ocean Outfall for Sewage

When a city prepares to build an ocean outfall for disposal of sewage, someone must decide its proper length. This might involve techniques for analyzing patterns of offshore currents, mass transport and diffusion. However, resolution of the current patterns to predict the effect of a proposed outfall on neighboring beaches is a task beyond the means of all but the largest cities. Nevertheless, an engineer must arrive at some decision as to proper length. Even where it would be possible to deduce an answer from data on currents, an engineer may need a quick estimate to decide whether an ocean outfall or some alternative means of disposal should be considered. The lengths of most ocean outfalls which have been built have been determined by the judgment of the engineer, guided by experience elsewhere.

Richard Pomeroy, consulting engineer, Pasadena, Calif., undertook the task of using the major parameters of an outfall to form an equation which will provide the engineer with better guidance in estimating the effect of any proposed outfall on nearby beaches. The equation which has been developed is confined to prediction of the average concentration of coliform bacteria at the beach, and has the form

$$n = \frac{kq^2}{yx^2}$$

where n is average coliform count, k is a constant, q is sewage flow, y is depth of discharge, and x is distance of the discharge from shore.

K will vary in different places, depending upon oceanographic and coastline features, but is presumed to have similar values in similar locations. Mr. Pomeroy has found this formula of great value in some major outfall decisions. He explained its derivation at the recent international conference on waste disposal in a marine environment, held at the University of California, Berkeley.

Minneapolis meets the demand for high pumping capacity with new Mack B-125, 1250 gpm units. These pumpers are powered by 276 hp Mack Thermodyne engines...have 200-gallon booster tanks...three 5" suction inlets and five 2½" discharge gates.

Minneapolis adds new MACK pumpers for more high-capacity fire protection

Among the busiest pieces of apparatus in Minneapolis, where grain fires are a constant hazard, are seven Mack high-volume pumpers, highlighted by two new Model B-125, 1250 gpm units recently delivered.

With their unsurpassed ability to pump huge quantities of water for hour after hour, these seven Macks, including one 1500 gpm and two 2000 gpm pumpers, form the backbone of the department's pumping fleet. Minneapolis considers such super-capacity a virtual necessity for maintaining the modern fire protection program it depends on for battling big fires.

Whatever *your* requirements, your department can benefit by using Macks. They're available in cab-forward or standard style, with a choice of engines headed by the famous Mack Thermodyne® 707C. Mack apparatus is custom-built to meet the requirements of your department. Mack Fire Apparatus, Allentown, Pennsylvania. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ont.

7166

MACK

FIRST NAME FOR

FIRE APPARATUS

COMPLETE LINE OF PUMPERS—500 to 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65' TO 144' . . . COMBINATION LADDER TRUCKS

PUBLIC SAFETY

A foam-throwing demonstration behind the Robert Moses Power Dam.

Bantam Fire Fighter

A small fire-fighting truck with big-truck features has just been put into service by the New York State Power Authority.

The "Little Mo" is a compact, versatile unit fitted to fight fire with water or foam.

Made to sell for about $10,000, as compared with $35,000 for a full-sized engine, and to be operated by only one man, the truck is especially practical for smaller communities, or as a trouble-shooter for cities. Smaller airports, race tracks, stadia, public recreation areas and super highways can also make full use of it.

The first unit, delivered by the American La France Corp. to the New York State Power Authority at Massena, N. Y., will protect recreation areas and buildings in and around Barnhart Island, near the Eisenhower Lock on the St. Lawrence Seaway.

In-cab controls allow for straight stream, fog-straight stream, foam-fog or fog combined with a wetting agent.

Two ground sweep nozzles, located beneath the front bumper, emit water, air foam or wetting agent, as do 150-foot hand lines on each side of the truck. The ground sweep nozzles permit the truck to literally chase grass fires, or to flush gasoline and chemicals from highways at the scene of accidents.

All of the firefighting equipment is mounted on a Dodge 4 x 4 all-wheel drive chassis, and is powered by a 205 bph V-8 engine.

The ground sweep nozzles, located beneath the front bumper, are shown using foam. Water would usually be used to extinguish grass fires and flush highways but airports must, at times, lay down a blanket of foam on runways.

Two Diesel Launches for New York Police

Two new police launches will replace two old vessels of the New York City Police Department and will be named in memory of two patrolmen killed in line of duty—Patrolman William G. Long and Patrolman Michael Talkowsky. The new launches are 50 feet long, with a 14-foot beam and a 4½ foot draft. They are equipped with diesel engines instead of gasoline engines. Equipped with two-way radios attuned to Manhattan Police Headquarters, sonar depth devices and first aid kits, stretchers, salvage pumps, and flood lights, they are capable of carrying 30 passengers.

The New York Police Department Emergency Service Division combines the activities of the Harbor-Precinct, Emergency Service Squads and the Aviation Bureau. The 13 police launches patrol 578 miles of New York harbors to prevent crime, give assistance to boats in distress, give disaster aid, cooperate with the Coast Guard and other federal agencies, and control the constantly increasing activity and numbers of private small boats and pleasure craft.

The two launches commissioned July 7 were built by the Bob Direcktor firm of Mamaroneck, N. Y. Each cost $63,000, has the twin GM Diesel 671 engines with each developing 240 horsepower and providing a speed of 22 mph. The engine sale to the police department was handled by the Griffin Equipment Co. of New York City.

Courtesy of the British Transport Commission

The picture above shows the containers placed in readiness for the arrival of the S. S. Oxfordshire. At left the containers are emptied after the Oxfordshire had docked.

Southampton Solves Dockside Refuse Problem

Collection and disposal of dockside refuse is a big problem in any port and Southampton's problem is bigger than most. But the docks engineers of the British Transport Commission have devised a method for the English seaport that probably will be adopted in many other busy shipping centers.

Equipment includes some 300 1¼-yard galvanized bulk containers, especially adapted for jacking truck handling, two Dennis Paxit Major compression-type refuse collection vehicles and a fleet of tubular steel Dennis jacking trucks.

These units provide the mobility and the flexibility of operation necessary for any shipside refuse requirements.

Each 51-inch-tall cylindrical container is supported on four angle legs that provide a clear space 8 inches under the container. Each of the two refuse collection vehicles carries its own jacking truck, and full containers are picked up, placed between hoist arms on the tailboard of the vehicle and automatically dumped into the packer unit.

Four men, including drivers, handle a total refuse load of about 200 tons per week with ease. Normal loading cycles average 72 seconds per container. The actual attachment, unloading and disengaging time at the vehicle amounts to less than half a minute per unit.

Dockside refuse collection is different from normal domestic refuse operations, principally because of the tremendous activity in the area of the ship in port. The refuse itself is different, including odd lengths of rope, oily rags, metal bolts, packing cases, drums, sawdust and even old lifebelts.

The important advantages found in the Southampton system are accessibility of refuse containers to the ship, the ease and speed of the collection operation, the maneuverability of jacking trucks and packing vehicles, plus the added advantage of individualized operation suited to the size of the ship served.

Three-City Garbage Plan Under Study

The cities of Passaic, Clifton, and Paterson, New Jersey, recently appropriated $40,000 to survey the feasibility of joint garbage collection and disposal. All three cities now use private contractors for this operation and are seeking ways and means to cut costs of the service.

A team from New York University's College of Engineering will conduct the survey. Estimated time of completion is nine months.

The City of Paterson authorized an appropriation of $16,000 for the study, and Passaic and Clifton will contribute $10,000 and $14,000, respectively.

Peoria Ash Pits On Their Way Out

In the past year, the open ash pits in Peoria, Ill. have been reduced from 1,050 to 830. These pits are open concrete or brick structures in which garbage, old cans, papers and other refuse is dumped and usually burned. Now obsolete, they once served as a convenient structure in which the householder dumped ashes from his coal furnace for later removal by the garbage collector.

Since they are potential rat and insect breeders the City Health Department is trying to rid the city of all such pits. Last year the Department sent out 865 letters with return post cards explaining that the City Street Department would clean up and remove the ash pits free of charge during periods when the weather did not permit work on the streets.

Letters were first sent to owners of pits adjacent to city streets, and finally to all owners of remaining pits. Requests for pit removal came from 223 owners.

In all cases street department employees removed the four enclosing sides of the pits. Wherever the owner so requested, the concrete slab at the bottom was left.

Fantastic?

Not when you *rent* a Wayne Street Sweeper, pay for it out of operating funds... and actually own it at the end of the rental period for just $1.00—*all without capital investment!*

Cities all across the nation... and cities of *every* size... are making this Wayne Rental Plan the simple, convenient method of starting their own street sanitation program. Labor savings alone can pay the cost, streets are kept sparkling clean, and the Wayne is yours for continued service for years to come.

Before you invest in *any* sweeper equipment or program, send for the brochure outlining the exclusive Wayne Rental Plan for municipalities. It's yours for the asking—*write today!*

WAYNE

WORLD'S LARGEST PRODUCER OF POWER SWEEPERS
SOLD AND SERVICED EVERYWHERE

WAYNE MANUFACTURING CO.
2431 East Lexington Street, Pomona, Calif.

Send me details on the Wayne Rental Plan

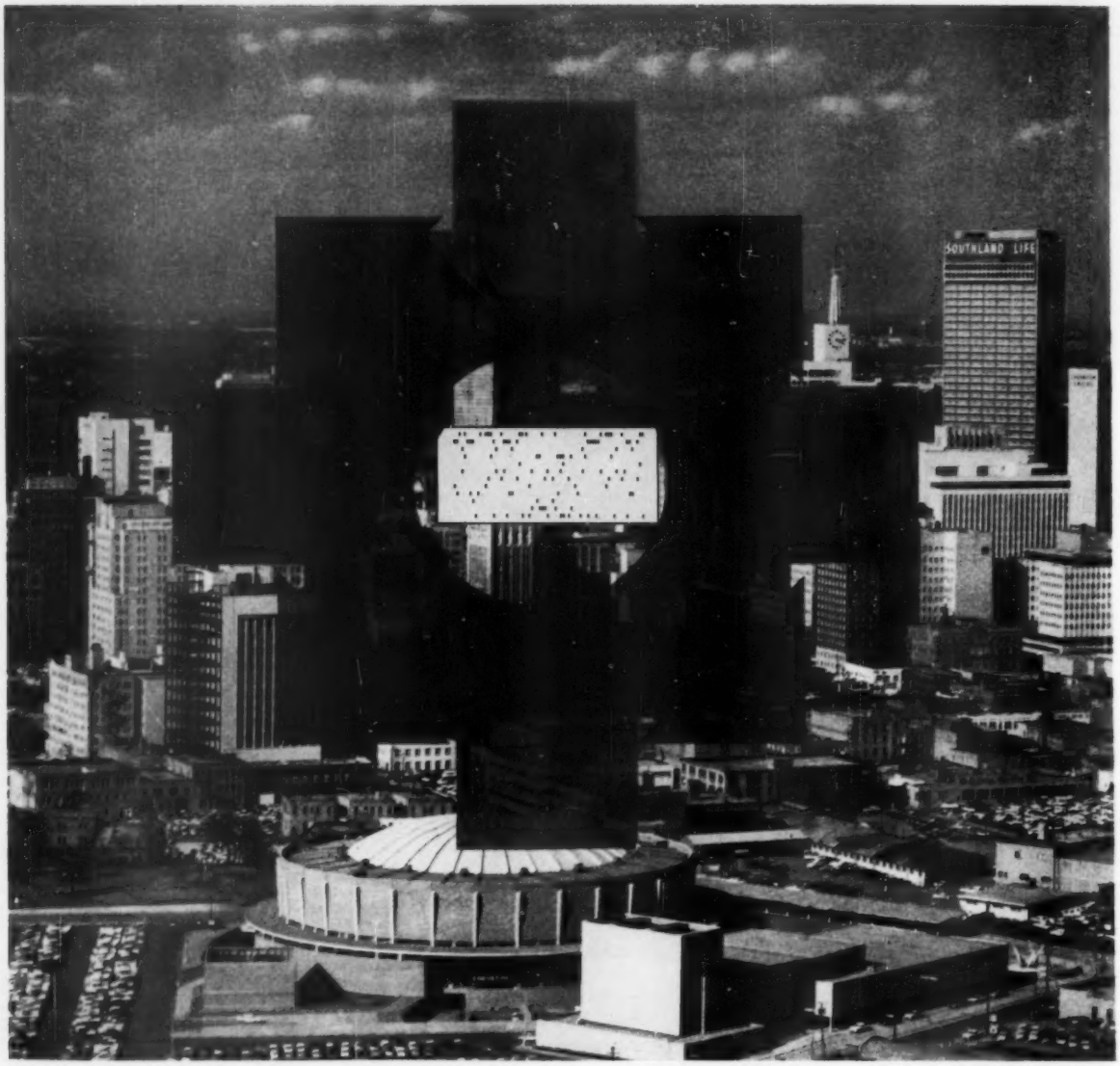
Name _____ Title _____

Firm _____

Address _____

City _____ Zone ____ State ____

POMONA, CALIF. • CHICAGO, ILL. • NEWARK, N.J.



Growing Dallas controls 10 city departments centrally with IBM punched card system

With one IBM punched card system, the City of Dallas achieves uniform accounting in ten major service departments.

City officials have been relieved of most accounting detail. With the IBM punched card system, they get an up-to-the-minute picture of each city department. Current operating reporting enables city officials to control budgets and provide even better service promptly and at substantial savings.

It will pay you to find out more about the Dallas Punched Card Story. Call your local IBM representative for details or demonstration.

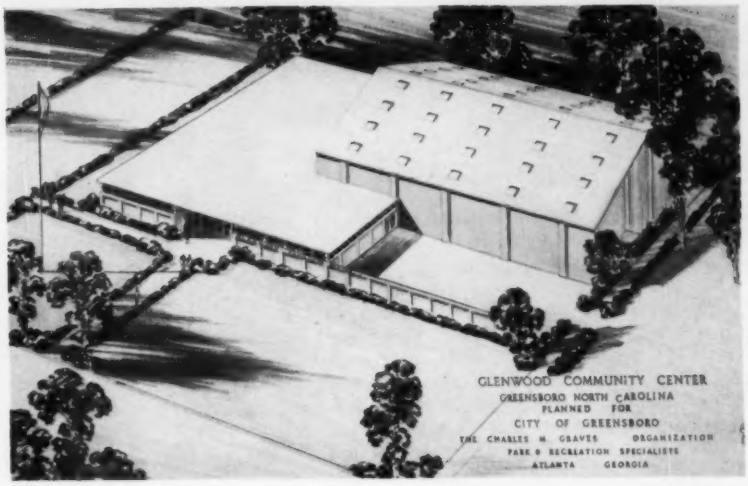
City of Dallas uses IBM punched cards to:

1. prepare payrolls and records
2. maintain budgetary control
3. bill and control real and personal property taxes
4. bill and control paving assessment
5. bill and control water sales
6. report and control inventories on water stores
7. summarize vehicle operating costs
8. handle accounting and statistics for police courts
9. report vital statistics
10. survey traffic

All IBM data processing equipment may be purchased or leased.

Mr. E. Lynn Crossley, City Auditor, Dallas, Tex.

IBM DATA PROCESSING



The new community center in Greensboro is scheduled for completion this coming spring.

Multi-Use Community Center in Greensboro

Greensboro, N. C. is currently building a new multi-use community center; it will be located on a beautiful level site, surrounded by a park area with space for tennis courts, softball fields, picnic area, and a children's playground.

Masonry Construction

The building will be of masonry construction. The exterior walls will be brick and the interior walls painted concrete block. Laminated wood trusses and beams fabricated by Unit Structures, Inc. will support the roof. The ceiling will consist of Tectum Tile, a fire-resistant, acoustical fibrous material, painted white for light reflection. Steel windows, door frames, toilet and shower partitions will insure easy maintenance.

The 23x28-foot lobby-lounge, will have tables and chairs for table games and chairs, sofas, and tables for conversational groups.

To the right of the lobby will be a 19x35-foot game room for table tennis, billiards, and similar games.

Opening from this game room through double doors is a 35x65-foot paved court. This will serve a multitude of activities, such as outdoor basketball, volley ball, shuffleboard, roller skating. It will be enclosed by the walls of the building on the west and south sides, and on the east, by a pierced brick wall extending the full length of the paved area.

Perhaps the most important feature of the building is the 68x94-foot room which will serve as gymnasium-auditorium-social hall. In the exterior walls of this room all windows have been omitted, adequate light during the day being provided by skydomes in the roof. Lighting fixtures are placed close to the ceiling. The gymnasium will accommodate a regulation 42x74-foot basketball court while one side wall will afford space for two practice baskets. Five sections of roll-away bleachers will provide seating for 420 people. In addition to basketball, this room will also be used for a variety of other games and for exhibits, dances, theatricals, parties, conventions and conferences.

A room, 8½x20 feet, adjacent to the gymnasium will store the equipment used there.

Boys' and girls' dressing rooms, each 12x23 feet, open off a passage leading from the gymnasium. The girls' dressing room will have toilet facilities and individual showers and dressing compartments. The boys' dressing room will be equipped with toilet facilities and gang shower. Nearby is the janitor's closet and storage space for building-maintenance supplies.

Immediately to one's left upon entering the lobby of the building is a large room 26x39 feet with two doors opening into the lobby. By the use of a folding wall, this space may be converted into two meeting rooms with separate entrances. These meeting or clubrooms will be used for classes, meetings, parties and other group activities.

A corridor leads from the lobby to connect with the passage from the gymnasium and to the right of this corridor are located the office and the furnace room. Windows in the office make it possible for the person in charge to see into the lobby (including the entrance), into the corridor and clubroom, and into the gymnasium. This is an advantageous arrangement from a control standpoint.

To the left of the corridor is a completely equipped kitchen which is 13x20 feet, so situated that food may be readily served over counters into the large meeting room, into the corridor, or into the clubroom.

The cost of the building is approximately $101,000. It should be completed by early spring.

The Glenwood Community Center was planned by the Charles M. Graves Organization of 1275 Spring Street, N.W., Atlanta, Ga. This organization specializes in planning recreational facilities.

OKA T. HESTER, *Director*
Parks and Recreation Department
Greensboro, N. C.

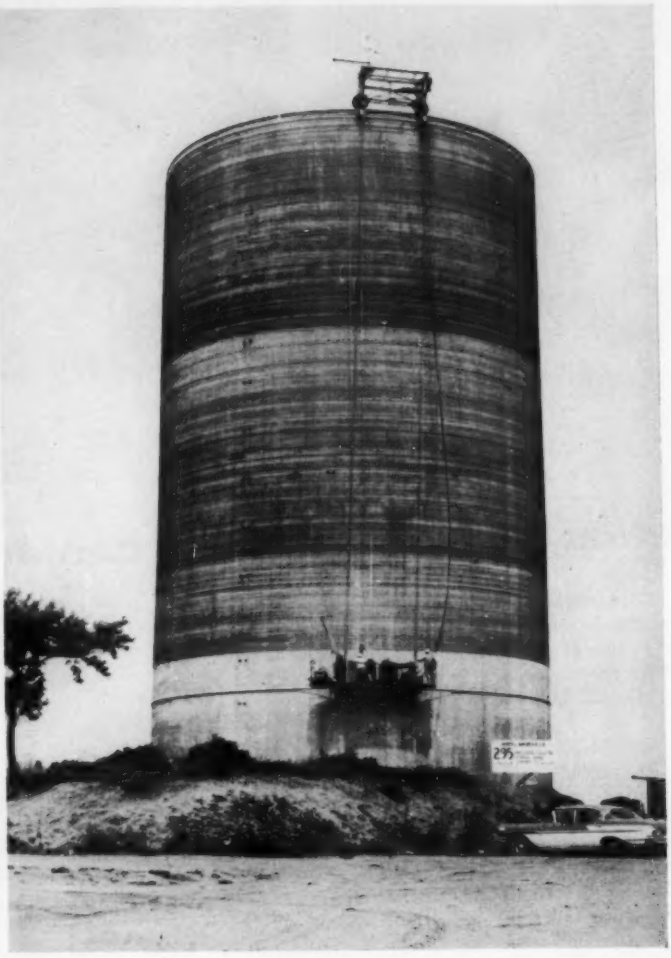
Largest Standpipe Of Its Kind

A new 2.95-million-gallon prestressed concrete standpipe has just been completed as part of a $1,200,000 Sayreville, N. J. water-expansion program. The cylindrical tank—122 feet high and 65 feet in inside diameter—is the largest of its type yet constructed.

The tank was built by the slip-form method, with forms for the dome roof carried up with the wall forms. The four-foot-high slip forms were elevated an inch at a time as concrete was placed. The dome forms, composed of 20 bow-string trusses, equally spaced between four wood-strut trusses that formed 90° quadrants, rested on the wales of the wall forms. Tie rods of the bow-string trusses terminated at holes in a 36-inch-diameter steel central plate.

The standpipe was designed and constructed by the Preload Co., Inc., New York. Prestressing of walls and the edge of the dome was done with the company's wire-winding machine which stretched and drew high-tensile wire as it propeled itself around the outside of the recently-set concrete cylinder. The dome was prestressed to withstand dead and live loads of the dome itself.

The master plan for the Sayreville water expansion program was developed by Charles J. Kupper, consulting engineer. New Market, New Jersey.



It's a long way around but each drawn strand exerts its share of the inward force against almost 3,000,000 gallons of water.

Nation's Longest Water Line Triples Capacity

The longest and largest water supply line in the U. S. will soon be able to carry three times the volume of water it carried prior to an expansion program begun in 1952. The soon-to-be-completed additions to the five pumping stations built by the Metropolitan Water District of Southern California will boost the original installed pumping capacity from 600 to 1800 cu. ft. per second.

The District's Iron Mountain pumplift station, located in San Bernardino county, is typical of those with increased capacities. It is 70 miles west of the water source (Parker Dam on the Colorado River) and from 170 to 270 miles east of the more than 7,000,000 southern California water users that it serves. Los Angeles, San Diego, more than 83 other incorporated cities and large unincorporated areas are eligible to receive water from the system.

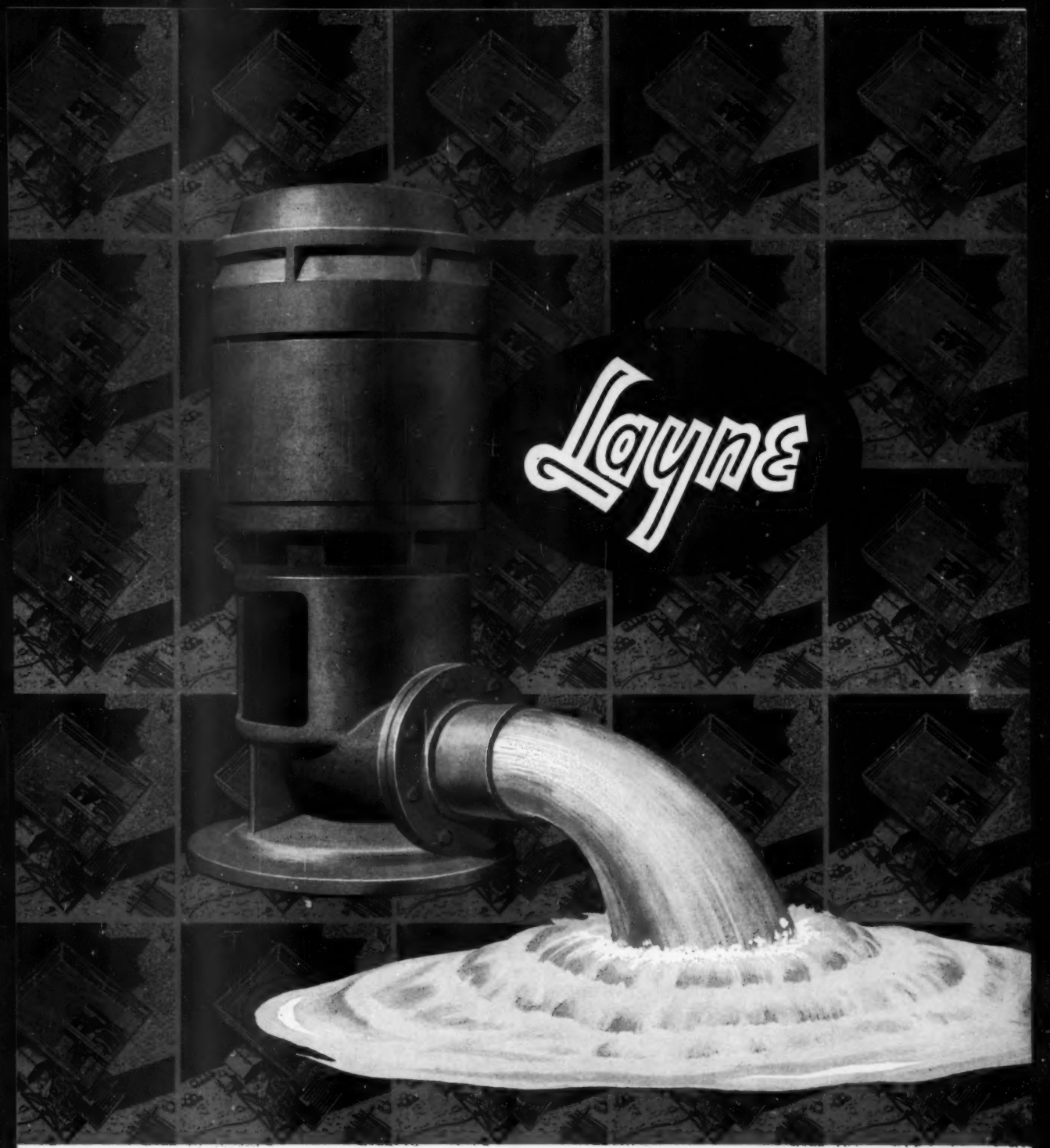
To reach the southern California area, water is carried 242 miles across the state of California, and is lifted over mountain barriers by five pumping stations.

The station now has nine pumps and motors, all Allis Chalmers. The pumps are 48-in. type SSV, 300 rpm, and have a capacity of 90,000 gpm at 146 ft. head. They are driven by A-C 4300-hp, 6900-volt, 300-rpm vertical synchronous motors for coupled service. The motors are enclosed and have air-to-water heat exchangers. Power to run the pumping motors is furnished from Hoover Dam.

Organized in 1928

The Metropolitan Water District of Southern California was organized in 1928 to plan, finance and build an aqueduct system to deliver water from the Colorado river to thirsty southern California. First task on the huge project was the mapping of 25,000 square miles of desert that had never been surveyed before. After eight years of study the present route was decided on.

In 1931 the District had 13 cities with a combined area of 640 square miles and an assessed valuation of about $2,000,000,000. It now has grown to include 85 cities, more than 3,300 square miles and an assessed valuation of more than $12,700,000,000.



Layne pumps top more producing water wells

Layne Pump Design, manufacture and installation are only part of the complete water service offered by the Layne organization. Other services include: Initial surveys, explorations, recommendations, site selection, foundation and soil sampling, well drilling, well casings and screens, gravel wall wells, construction of water systems, complete research staff and facilities, maintenance and service, chemical treatment of water wells, water treatment. *Write for Bulletin No. 100.*

WORLD'S LARGEST Layne WATER DEVELOPERS

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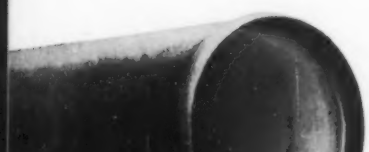

CONSERVATIVE DESIGN is one of the important reasons why American Concrete Cylinder Pipe has gained such high acceptance by engineers and water works officials in the west. The composite design of the pipe is based on a factor of safety of 2¼ at the elastic limit of the pipe. American Concrete Cylinder Pipe will safely withstand sudden and severe increases of pressure – surge and water hammer – or the occasional concentrated external loadings met under unusual field conditions.

The *composite* action of the mortar lined steel cylinder, circumferential rod reinforcement and external mortar coating accounts for the consistently successful performance record of this type of pipe. The use of a minimum of 25% to, under certain conditions, 50% or more of the total required cross-sectional steel area as tension-wound circumferential reinforcement substantially increases the pipe's external supporting strength over that which would be obtained if all of the required steel area were placed in the cylinder alone.

Take advantage of American Concrete Cylinder Pipe's greater inherent strength through more effective use of materials – see an American sales engineer when planning your next project.

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Air Pollution Control Notes

Honolulu Assesses Cost

A start on air pollution control in Honolulu will cost approximately $110,000, it was announced recently by Yoshio Kunimoto, City Engineer. Mr. Kunimoto pointed out that open dumps and some incinerators are the worst sources of air pollution in the city. Sanitary landfill operations, to end open burning, and work on the existing incinerators are the major items in his estimate.

U. S. and English M.D.'s Comment

Air pollution and its effect on health is a topic of never-ending news value. At a health conference in Lake Placid, N. Y., Dr. Richard A. Prindle, Chief of the Public Health Service's Air Pollution Medical Program, said that the Service has evidence that indicates a relationship between air pollution and cancer of the stomach, lungs and esophagus. He also said that air pollution may have "especially adverse effects on persons with existing heart or respiratory defects." Meanwhile, in Los Angeles, Dr. John Goodwin, London heart specialist, stated that although it cannot be said that air pollution causes lung or heart diseases, in England there is little doubt that air pollutants increase the incidence of acute lung and heart disease attacks. Dr. Goodwin said: "When a bad smog comes down, we expect an increase in the number of patients with chronic lung and heart disease who will be thrown into acute attacks within a few days."

Philadelphia Improves

The Air Pollution Control Section of the Philadelphia Health Department, in its annual report for 1958, states that the air of the city is cleaner than it has been in recent years. Sootfall, dust and sulfur dioxide were down from figures three years previous, but "The amount of carbon monoxide was not significantly lower."

Los Angeles County Air Pollution Control District

Los Angeles went through its first alert-free summer in five years recently and the question was: did the use of natural gas in industry from May 1st through September 30th help turn the trick? Under Los Angeles regulations, refineries, steam plants and other industries must burn natural gas during the summer months, when the fuel is in abundant supply. If Los Angeles really was helped by the use of natural gas, it may have an effect on other parts of the country and on New York City almost immediately. In New York, the Department of Air Pollution Control has been considering rule changes which would make it easier for home heating equipment to be converted to natural gas. The move is being fought by fuel oil and coal interests.

Underfeed Stoker Chart

The Bituminous Coal Institute is distributing a chart, "Cleaning Fire and Restoring Fuel Bed on Underfeed Stokers," which can be obtained by writing to Mr. Harry C. Ballman, Bituminous Coal Institute, 800 Southern Building, 15th and H Streets N.W., Washington 5, D. C.

Air Pollution Courses

Rutgers, the State University of New Jersey, has again offered two courses in air pollution for the academic year 1959-1960. "Principles of Air Pollution Control" was held on Fridays from 2 to 5 P.M. in the fall semester and "Air Sampling and Analysis" will be given on Fridays from 1 to 5 P.M., beginning February 5, 1960. Further information may be obtained by writing to University College (Evening School), 77 Hamilton St., New Brunswick, N. J.

Annexation Helped In Kalamazoo

Virtually everyone in Kalamazoo is getting more efficient municipal government at lower cost now that the suburbs have joined the central city, according to the American Municipal Association.

Kalamazoo's city manager, Clarence H. Elliott, reports that this city brought in 22,000 more people and 14½ square miles since 1955 (bringing its present size to 81,000 people and 24 square miles). These benefits resulted:

- **the per capita cost of local government dropped 5%.**
- **the number of city employees per capita dropped 15%.**

Immediate costs, however, have gone up, since outlying residents were promised storm and sanitary sewers if they joined the city. These former suburbanites will save large sums compared to the cost of providing identical services for themselves.

Greatest per capita savings came in the health, recreation, airport, parking lot, and elections departments. Greatest increases in per capita costs after annexation came in the research and planning departments.

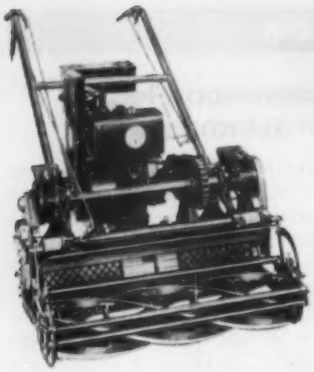
The city's 10-year budget "anticipates a gradual reduction of the fixed debt, small and gradual increases in the tax rate and percentage of assessment, and a stabilization of the operating budget," the manager indicates.

120 Cities Participate in National Downtown Week

One hundred and twenty cities in the United States and Canada paid homage to the advantages of downtown business and shopping during the week of October 18th-24th.

The simultaneous observance included cities from Dartmouth, Nova Scotia, to Waco, Texas. Participating cities ranged from giant New York City (population eight million) to Girard, Ohio (population 10,000).

Lawrence, Mass. presented a 1960 Outdoor Automobile Show, plus showings by fashion models in 25 Main Street stores, and a down-



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town-wide sale. Each day of the week Lawrence saluted a neighboring community.

Sacramento, Calif., selected a "Miss Downtown Week," who awarded prizes to winners of a "give-away" promotion. As a tie-in with the opening of the motion picture, "Best of Everything," one couple won a trip to Hollywood.

Elizabeth, N. J., scheduled an art show with Pat Suzuki, who is currently playing in "Flower Drum Song" in New York City, and other entertainers welcoming visitors. The city also set up a special Elizabeth historical exhibit in the downtown area. A dance band in a truck trailer led a cavalcade of celebrities in new-model cars through the city.

Manchester, N. H., held prize drawings valued at $5,000 in merchandise and New Haven, Conn., arranged for a special tabloid section in the Sunday newspaper.

Urban Revenue Spending Rose 7% in 1958

City governments in the United States spent $13,775,000,000 in fiscal 1958, according to a report issued recently by the Bureau of the Census, Department of Commerce, a sum 7% greater than in 1957.

Revenue of the 17,000 cities altogether amounted to $12,832,000,000 in 1958, or about 7% more than in the previous year. The cities borrowed $2,622,000,000 and redeemed $1,254,000,000 of previous indebtedness, so that their outstanding debt rose to a new high of $20,355,000,000 at the end of fiscal 1958.

These figures include amounts for city-operated utilities and employee-retirement systems. Excluding such amounts, "general revenue" of the city governments amounted to $9,895,000,000. Municipal taxes provided nearly two-thirds of this sum.

City property taxes yielded $4,570,000,000 in 1958, or 6% more than in 1957. Collections of municipal general and selective sales taxes amounted to $972,000,000 in 1958, and other city tax revenue totaled $700,000,000.

Intergovernmental revenue, mainly from the states, supplied $1,953,000,000, or nearly one-fifth of city general revenue in 1958. Other non-tax sources—including current charges, special assessments, and other general sources — provided $1,700,000,000.

General expenditure of the city

(Continued on page 36)

Stretching the long arm of the law in Manhattan

New York, N. Y. — The nation's first city boasts one of the nation's finest police forces. And part of this well-coordinated department is a mobile task force of 144 officers mounted on Harley-Davidson Solos.

Premier protection for a prominent visitor

...New York's finest on Harley-Davidson Solos

Maximum Security — American Style — Soviet Premier Khrushchev was well protected on his recent arrival in New York City. Alert members of the New York Police Dept. on Harley-Davidson Solos were an important part of security measures. Long experience has proven that only Solo-mounted officers keep things moving smoothly at parades and civic functions. Perfect visibility backed by swift mobility minimizes "security risks."

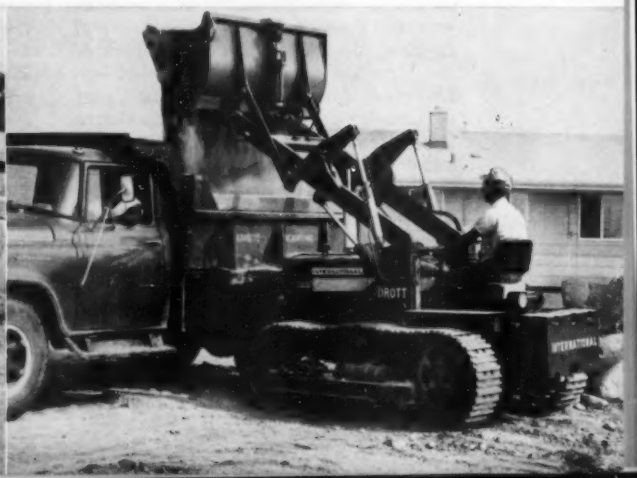
Modern police departments everywhere — large and small — are making the Harley-Davidson mounted officer the spearhead of their law enforcement. It's a logical choice, for only the Solo can give you truly flexible action — in emergencies . . . criminal apprehension . . . spot traffic control. For a closer look at law enforcement the Solo way, call your Harley-Davidson dealer or write Harley-Davidson Motor Co., Milwaukee 1, Wisconsin, for new brochure.

HARLEY-DAVIDSON

Police Motorcycles

Automatic hydraulic self-leveling bucket gives the operator a clear view with the International Wagner loader —unobstructed by cumbersome mechanical linkages. Big, ⅝-cu yd bucket is 64 inches wide, has 3,500-lb capacity. Notice how unsightly external hose connections are eliminated by T-340 internal pump design.

New International Drott Four-in-One. Only the new T-340 offers this versatile, high-production unit in the utility crawler field! Left below, showing exclusive clamshell action for "surrounding" materials, or dozing close to green foundations without excessive ground pressure. Right, bottom-dump action provides 9 ft, 6-inch under-bucket clearance. Also, use the Four-in-One as a regular bucket with ¾ cu yd (SAE struck) capacity; a scraper for inch-close grading accuracy; or a bulldozer with adjustable, radius-controlled moldboard for live, earth-rolling action. Parallelogram linkage holds bucket level from ground level to dump height.



already, they're calling it the

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New 45 hp* International Crawler leads its field in *POWER · SPEEDS · STEERING · EQUIPMENT!*

Reports from new T-340 users express amazement at its capacity . . . *its push and pull power*, compared with what they expected from a 31 drawbar hp rating. But when you measure the T-340 against its field, you see the reasons!

- **A quiet, smooth-running, 4-cylinder engine** with a proven pedigree for stamina and fuel economy.
- **Characteristic IH power-weight ratio,** delivering 95 per cent of the T-340's *built-in* operating weight of 5,600 lb as pull at the drawbar.
- **Job-matched speeds.** Only the T-340 in its power class offers Torque Amplifier Drive—providing *two* speeds in each of the five regular gears, letting you boost pull power up to 45 per cent, *on-the-go*, without declutching. Or, equip the T-340 with Fast Reverser, giving you *five reverse speeds*, each 22 per cent faster than the corresponding forward gear speed.
- **High-capacity, internal hydraulic pump,** gives instant-quick, fast-cycle equipment control.
- **Exclusive new planetary steering and final drive** —quick, easy pivot or "feathered" turns.

Measure the new T-340 by either price or performance . . . you'll quickly see why it's easily today's top value in the utility tractor field. See it *soon!*

*Maximum flywheel hp

CASH BONUS for Early Traders! Right now, your IH Dealer will pay you interest, at the rate of 6% for a specified time, on the value of your trade-in and/or cash payment toward the purchase of new International utility tractors and equipment! Cash bonus paid *immediately*. Protect yourself against possible price increase . . . assure delivery in time for spring jobs—*See your IH Dealer NOW!*

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International Harvester Products pay for themselves in use —Farm Tractors and Equipment . . . Twine . . . Industrial Tractors and Equipment . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

New International hydraulic bullgrader, is raised, lowered, tilted, and angled to right or left—all with fingertip hydraulic control. Blade is 85-inches wide and 25 inches high, plus a 7-inch center spillboard. Can be used in combination with scarifier, winch, and other rear-mounted equipment.

International Wagner Loader and backhoe can be mounted separately or in combination to form a highly efficient trenching, backfilling, and loading unit. Backhoe can be equipped with regular, mole's paw, bell hole, cemetery, or heavy-duty street repair bucket.

(Continued from page 32)

governments (i.e., excluding utility and retirement system spending) amounted to $10,442,000,000 during 1958. This sum includes capital outlays for public improvements and equipment, as well as spending for current operations. The total was:

Item	1958 amount (in millions)	% increase from 1957
Education	$ 1,636	11
Streets and highways	1,455	10
Sanitation	1,248	8
Police protection	1,130	9
Fire protection	774	9
Health and hospitals	713	1
Public welfare	530	7
Recreation	501	9
All other	2,455	6
Total general expenditure	$10,442	8

The census report emphasizes that these figures cover only the finances of the city governments and their dependent agencies, and do not include amounts for overlying counties, separate school districts, and other local governments.

NOTE: Information cited above is taken from the Bureau of the Census report, *Summary of City Government Finances in* 1958. For sale by the Bureau of the Census, Washington 25, D. C., and all field offices of the Department of Commerce. Price 10 cents.

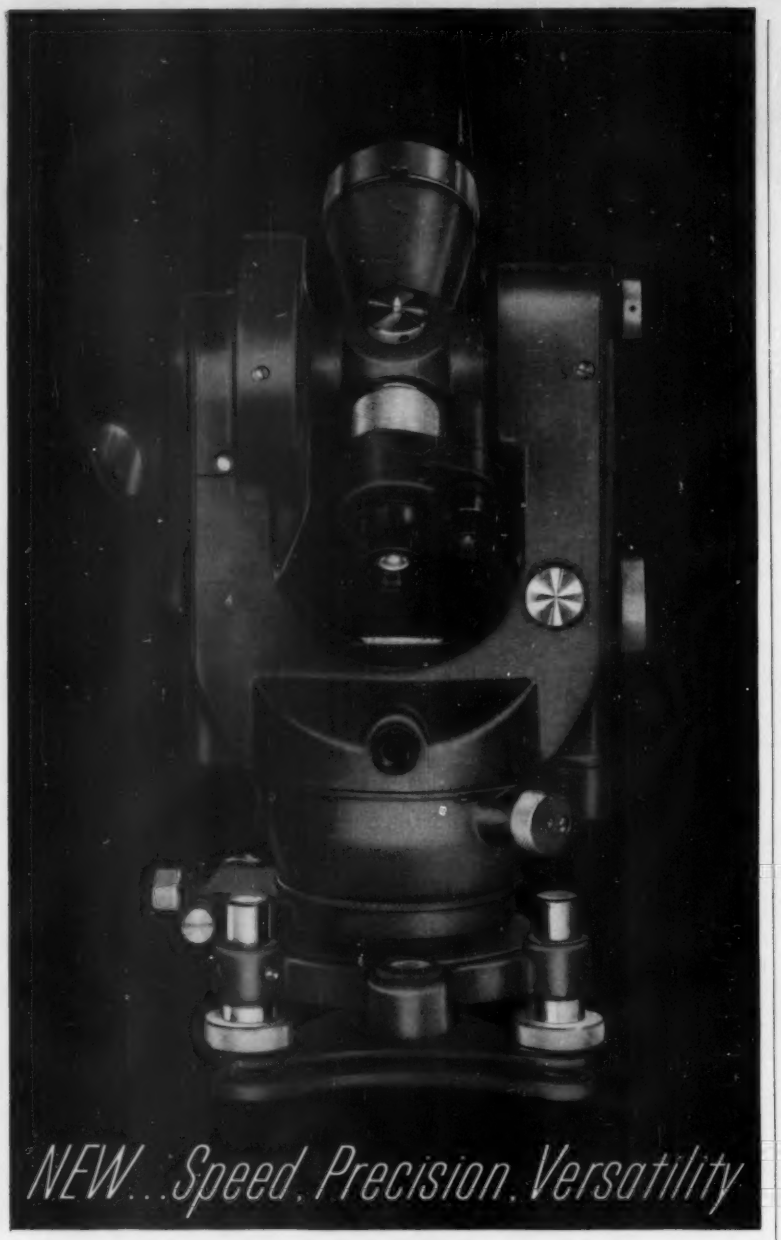
Philadelphia Makes Land Inventory

Philadelphia will soon have a complete record of how each parcel of land is being used within the city. The extensive inventory has just been begun by the Sanborn Map Company.

The inventory includes listing, mapping and measuring Philadelphia's existing land use areas and establishments by activity types.

The inventory will help Philadelphia forecast future space requirements so that land and floor space of the right kind in the right location can be earmarked for the needs of the next 10 to 20 years.

First steps in preparing these estimates of future requirements are to detail the present land and floor space uses in an inventory and to map and measure them. All information will be recorded for easy transfer to punch cards which can be automatically processed by the city's computing equipment to give various statistical tabulations.



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Vertical angles can be read immediately after set-up. No need to center vertical circle level...no cleaning or maintaining moving parts.

Highway, mining, or any other surveying project, day or underground, becomes routine with the Wild T-1A.

Upper and lower motions for setting on zero and for repeating. Built-in optical plummet.

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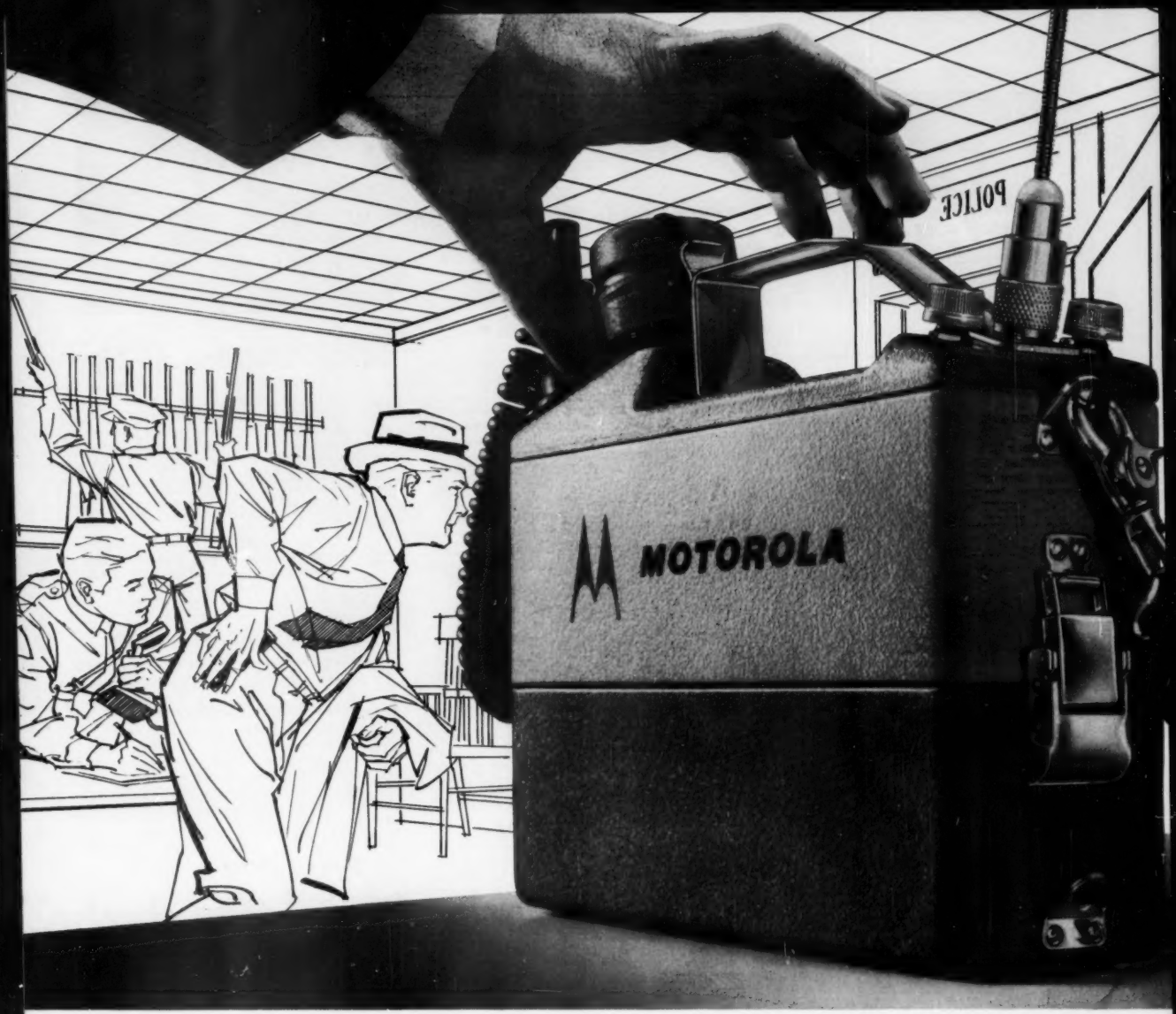

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Whether it's traffic or crowd control . . . riot or robbery . . . wherever coordination between men on foot is required – Motorola "Handie-Talkie" portable radios let you keep tabs on trouble faster and safer. You bolster the effectiveness of every officer . . . facilitate split-second timing . . . control every maneuver. To be sure, make sure you have *enough* "Handie-Talkie" radios.

Transistors, plated chassis and other improvements increase reliability . . . make this the smallest, lightest portable 2-way radio available. You also benefit from the long battery life and obsolescence-free design. And only Motorola can offer you a portable radio with a full 8 watts output. One of the 43 "Handie-Talkie" radios is ideal for your needs. Write for complete literature today.

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Write directly to the address given or use the Post Card on page 51.

All-Aluminum Swimming Pools

100 These pools can be assembled in just a few days, and usually cost less to install because prefabrication minimizes labor costs. Maintenance is always less because the pools are impervious to both interior and exterior corrosion. They are also immune to settling and soil shifts. For descriptive literature, write CHESTER PRODUCTS, INC., DEPT. C, BELLE AVE. & B. & O. R.R., HAMILTON, OHIO.

Sewage Treatment for the Small Plant

101 New 8-page *Bulletin* 6692, just issued by DORR-OLIVER INC., HAVEMEYER LANE, STAMFORD CONN. under the title "Small Plant Sewage Treatment," describes the design, operation and advantages of four equipment units which provide both clarification and sludge digestion in a single tank and are particularly applicable to small scale operations.

Municipal Accounting

102 Any municipality planning to update its accounting procedures will find the *Dallas Punched Card Story* of considerable benefit, for it tells in detail how the City of Dallas, Texas achieves uniform accounting in 10 major service departments with one IBM punched card system. For this Data Processing story, write your local International Business Machines representative.

Reliable Fire Apparatus

103 For information on a complete line of custom-built pumpers (500 to 1250 gpm), available in cab-forward or standard style and with a choice of engines, squad and hose wagons, aerials (65' to 144') and combination ladder trucks, write MACK FIRE APPARATUS, ALLENTOWN, PA.

"Containerized" Refuse Collection

104 A 24-page booklet has been carefully prepared by LODAL, INC., NORWAY, MICH., to explain its Load-A-Matic container system, designed for low cost, high-speed refuse handling and to work with Hydro-EZ Pack refuse bodies. The booklet is well illustrated and specifications are included.

Surveyor's Casebook

105 By writing to KEUFFEL & ESSER CO., DEPT. AC-12, HOBOKEN, N. J., municipal engineers and surveyors can obtain a free copy of the Zeiss Level Casebook, which contains a collection of case histories from around the world and is full of worthwhile surveying tips and techniques.

Jobsite Concrete Tester

106 New catalog literature from the TESTER DIVISION OF FORNEY'S INC., BOX 310, NEW CASTLE, PA., describes Model FT 20, designed for testing at the jobsite the compressive strength of concrete cylinders, cores, blocks, beams, cubes, brick and drain tile.

Destroys Odors

107 Ozone generating equipment for the destruction of obnoxious odors in sewage handling, water purification, industrial wastes and for odor control in public buildings receives thorough explanation and presentation in literature offered by AMERICAN ELECTRO CHEMICAL PROCESS CORP., 1721 N.E. MIAMI CT., MIAMI 32, FLA.

Tubeless Street Lighting Control

108 Terminal isolation, which prevents "flashover" trouble, is the latest innovation in Sun Switch street lighting controls and a feature of the Model 5940 tubeless control. For full facts on this important development, write SUN SWITCH DIVISION, RIPLEY CO., MIDDLETOWN, CONN.

Traffic and Pedestrian Signals

109 . . . that offer a wide range of installation and operation flexibility are given thorough coverage in descriptive *Traffic Signal Bulletin* A10, which can be obtained from EAGLE SIGNAL CO., MUNICIPAL DIVISION, DEPT. AC-1259, MOLINE, ILL.

For Low-Cost Outdoor Lighting

110 A new bulletin fully describes all models of the Hope metal pipe pole base, a weather-resistant, durable, malleable cast iron support of outdoor lighting uprights with its own junction chamber for splicing and grounding. Bases are available in sizes to receive 2", 2½", 3" and 4" threaded pipe. For a copy of *Bulletin* 25, write HOPE ELECTRICAL PRODUCTS CO., 53 LONG AVE., HILLSIDE, N. J.

Construct, Repair Concrete Inexpensively

111 The 48-page "Gunite" booklet currently available from PRESSURE CONCRETE CO., 1555 HELTON ST., FLORENCE, ALA., contains valuable information on an economical way to repair, construct or line reservoirs, filter plants, sea walls, swimming pools, stadia and sewage disposal plants.

Need Pleasure Boat Harbors?

112 Complete waterfront equipment to help your community meet the boating boom can be obtained from STANDARD STEEL PRODUCTS, DEPT. A, 2836 S. 16TH ST., MILWAUKEE 15, WIS. Safety, convenience and long life characterize these facilities. Modular construction permits greater flexibility to meet individual needs and to provide for future expansion.

Removes Frost from the Ground

113 Designed especially for cemetery use, this portable frost remover dries the ground as it draws the frost. It is automatic in operation, fully insulated to concentrate heat, uses economical bottled gas and conditions soil for digging and back filling. For descriptive literature, write WILBUR SAGE CO., 1111 5TH AVE., MOLINE, ILL.

Low Cost, Pipe Detector

114 Designed for all-purpose work and adaptable to both large and small pipe, this portable Model E-4 detector features direct current, high potential output and accurate bell signal alarm. For descriptive literature, write TINKER & RASOR, 417 AGOSTINO RD., P. O. BOX 281, SAN GABRIEL, CALIF.

Dual Fuel

115 . . . is the title of a new *Bulletin*, EG-346, issued by ENTERPRISE ENGINE & MACHINERY CO., 18th & FLORIDA STS., SAN FRANCISCO, CALIF. It describes and lists the advantages of this fuel system and presents a concise explanation of how it permits an Enterprise diesel engine to burn gaseous fuels, including natural gas and sewage gas, as well as diesel oil.

Preventive Tractor Maintenance

116 A series of 4-color cartoons (11" x 13") that forcefully yet humorously bring out the importance of preventive maintenance on crawler tractors and attachments is offered free to owners and operators of construction equipment. The cartoon posters are keyed to seasonal problems. For copies, write J. I. CASE CO., INDUSTRIAL ADVERTISING DEPT., RACINE, WIS.

Sewage Lift Stations

117 For literature on a complete line of sewage lift stations, designed to operate reliably in any sewage collection situation, write YEOMANS, 2000-3 N. RUBY ST., MELROSE PARK, ILL., specialists in building equipment for lifting sewage in sizes that range from small ejectors to large pumping stations.

Centralized Control System for Water Works

118 An extremely flexible and dependable centralized monitoring and control system that enables you to control every operating function in your water system from a central station is described in *Bulletin* No. 5903, available from FEMCO, INC., IRWIN, PA.

Structural Steel Pipe for Traffic Applications

119 Round and elliptical, high-strength, lightweight pipe for traffic sign posts, parking meter stanchions, highway and bridge railings are described in a 4-page illustrated brochure, available from TEX-TUBE, INC., 1503 N. POST OAK RD., HOUSTON, TEXAS.

Safety Sign Bulletin

120 You'll find warning signs to meet every municipal requirement in 45-page *Catalog* C-4, now being offered by STANDARD SIGNS, INC., 3190 E. 65th ST., CLEVELAND, OHIO. Signs are of steel finished in either synthetic or porcelain enamel, for inside and outside use.

(See page 42 for more Bulletins)

Today's smallest two-way mobile radio - actual size!

New General Electric Transistorized Progress Line

General Electric's new Transistorized Progress Line will fit in more places, in more different positions, than any other two-way mobile radio you can buy today.

Not only is this the world's smallest, lightest commercial two-way mobile radio, but standby battery drain is so low you need never turn off your TPL mobile unit, just like the clock in your car. You install no special generator, use less gas, require fewer engine jobs.

TPL is the first two-way radio that transmits up to 75 watts of power in high band . . . the first that really fits under the dash . . . the first to realize the full benefits of transistorized design (no more than four tubes) . . . the first to eliminate bulky cables through new one-piece design of receiver control and transmitter . . . the first with shielded dirt-free ventilation.

The new General Electric TPL ushers in a new era of convenience and reliability in mobile communications. Don't miss all the exciting details. Write General Electric Company, Communication Products Dept., 11259, Mountain View Road, Lynchburg, Va.

GENERAL ELECTRIC

Communication Products Department

NOW!

A choice of transmissions

For All-Out Production...

TL-14 with FULL POWER-SHIFT TRANSMISSION

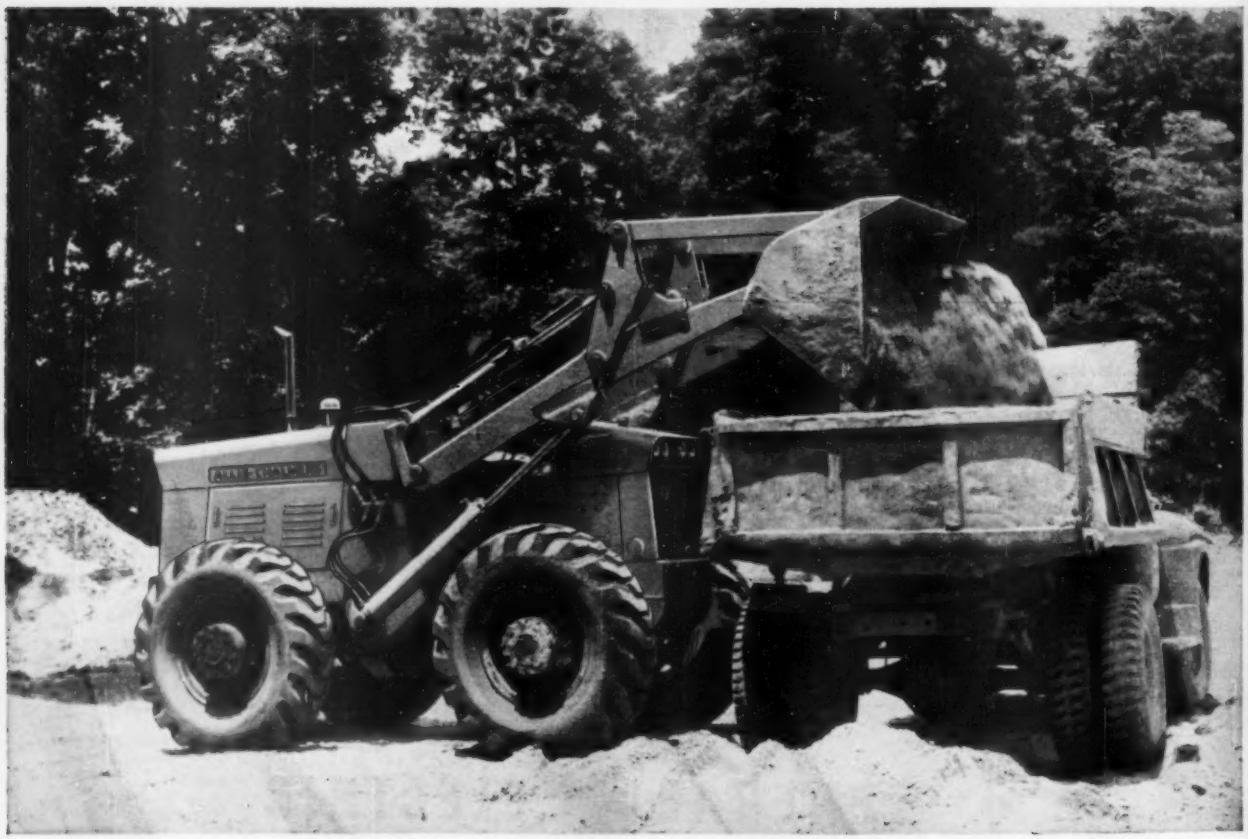
Exclusive single-lever speed and direction control!

You get more than just a full power-shift transmission with the TL-14 TRACTO-LOADER. You get a transmission that is controlled by ONE LEVER — not two or more levers or a combination of levers and foot pedals.

This means no stopping to shift to get into a higher gear. You go into and out of any forward or reverse gear "on-the-go"—from low to second or high instantly, while moving.

And you get a power-shift transmission that is equipped with a torque converter with a big 3.5-to-1 ratio of torque increase at full stall — more than any other loader its size. Means you get the job done — faster, easier — in toughest going.

If you are after all-out production at the pile, if your hauls are long . . . if loading work is scattered and you want to go from one job to another in a hurry — then the TL-14 with a full power-shift transmission can't be beat. A demonstration will convince you.



The TL-14 has MORE of everything! More Reach — dumps right into center of high body trucks. More Carry Capacity — 5,300 lb. More Breakout Force — 18,800 lb. More Power — 86 hp gasoline, 83 hp diesel. And there's a family of six buckets to choose from — 1 to 3 cu yd.

for a wheel loader

For All-Out Savings...
TL-14 with TRACTOMATIC TRANSMISSION
simple design • economical • power-operated

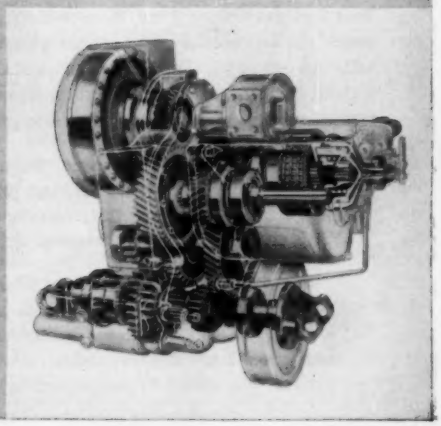
Now you can get a transmission that gives you the ease of operation you want at big savings. The optional TRACTOMATIC transmission for the TL-14 TRACTOLOADER is hydraulically operated and simple in design.

Because there are fewer parts and gears and only two clutches (easy to get at), the price and maintenance of the TRACTOMATIC is considerably less than a full power-shift transmission. This means a lower first cost for the TL-14 . . . lower upkeep, easier servicing throughout its life.

Extensive field tests prove that the TL-14 with a TRACTOMATIC transmission will perform as well or better than other loaders with full power-shift transmissions on short-haul loading and stockpiling.

If you want a good, reliable, easy-operating loader, you can really save money by choosing the TRACTOMATIC transmission for your TL-14. Ask your Allis-Chalmers dealer to show you what it can do. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

FAST, EASY SHIFT — Operator just flips a lever on the steering column to go forward or reverse. Since the reverse speeds are 30 percent faster than forward, you get the extra back-away speed you want without shifting into a higher gear. To get this higher reverse on most other loaders, two separate levers would have to be moved.



HYDRAULICALLY OPERATED — Note the simple, compact design of the TRACTOMATIC transmission in this cutaway. Two multiple-disc clutches — just outside the transmission — are hydraulically actuated and share the work load. One is for forward, the other reverse. As one works, the other rests and cools — an important contribution to long clutch life. Both are accessible for quick adjustment.

move ahead with ALLIS-CHALMERS
...power for a growing world

PLAN *Low-Cost* BRUSH DISPOSAL-

PLAN ON A FITCHBURG CHIPPER

FAST...ECONOMICAL...SAFE

Plan on *low-cost* disposal of trimmed branches, whether it's for a tree company, utility, highway department, a city, or a park department—plan on getting a Fitchburg Chipper.

This well-engineered and rugged machine turns brush into easy-to-dispose-of chips, at very low cost. Only the Fitchburg Chipper has an exclusive, patented Feed Plate which automatically adjusts for any size brush up to its rated capacity, making it possible to chip large or small material with ease.

This Spring-Activated Feed Plate reduces shock action and horsepower requirements since it permits chipping of larger size wood without extra power. The Feed Plate results in fast, efficient chipping without a heavy, cumbersome fly wheel. The smoother chipping action means lower maintenance, too, as well as greater crew safety.

This safety feature is important. "Because of the feed plate with its safety spring the men can't get hurt by any backthrow from the Chipper," explains the Superintendent, The Park and Shade Tree Commissions, Bridgeton, New Jersey.

Please send in the coupon for more information, and for copies of articles on chipping which appeared recently in leading publications. These feature articles describe five methods of brush disposal, and ten new ways to utilize "by-product" chips. Send for your copies, they are well worthwhile.

FITCHBURG ENGINEERING CORPORATION

Dept. AC-129, Fitchburg, Massachusetts.

☐ Please send me important articles which describe 5 methods of brush disposal, and 10 new ways to utilize brush chips.

☐ Please send more information on Fitchburg Chippers.

Name_____

Address_____

City_____ Zone____ State_____

FREE catalogs

Write directly to the address given or use the Post Card on page 51.

Plows to Meet Municipal Snow Removal Problems

121 Four basic types of snow plow, each with models to fit 1½- to 2-ton trucks and designed for the power and performance to meet municipal snow removal needs more quickly, more safely and at lower cost, are the subject of new literature being offered by FRINK SNO-PLOWS, INC., CLAYTON, N. Y.

Cut Lighting Maintenance Costs Up to 50%

122 Descriptive literature reports that numerous city and state governments using Skyworker aerial lifts are doing just that, and are replacing as many as 125 lights a day. They also use their Skyworkers to hang and service traffic lights, for tree trimming and in fire fighting and rescue work. For details, write EMHART MFG. CO., SKYWORKER DIVISION, HARTFORD 1, CONN.

Rockwell's New Water Meter

123 . . . is a 1" sealed register water meter that incorporates the advantages of a powerful magnetic drive which eliminates the need for a stuffing box. Its sealed register never fogs or corrodes and is easy to read. Only two of its parts operate in water. For full facts, write ROCKWELL MFG. CO., PITTSBURGH 8, PA.

Aluminum Chain Link Fencing

124 Now you can obtain a 12-page illustrated booklet and a summary of recently bid prices on 4' high and 6' high all-aluminum, maintenance-free, corrosion-resistant fencing by writing to ALUMINUM COMPANY OF AMERICA, 2058L ALCOA BLDG., PITTSBURGH 19, PA.

Sand and Gravel for Water Filters

125 Information on clean, carefully graded filtering media that feature the chemical and physical properties needed to assure proper filtering in the most meticulous municipal water filtering plants can be obtained from NORTHERN GRAVEL CO., BOX 307, MUSCATINE, IA.

Eliminates Odor and Grease Problems in Sewer Lines

126 A new technical bulletin, which gives full facts about the Cloroben Up-Sewer Rotation Method, includes directions for odor and grease control, cleaning of wet wells, force mains and sewer lines. For a copy, write CLOROBEN CHEMICAL CORP., 115 JACOBUS AVE., S. KEARNY, N. J.

Helicopter Police Protection

127 . . . at half cost can become a reality for your community, if it participates in a matching funds plan as set up by the Office of Civil and Defense Mobilization. The brochure, "America's New Mounted Police" gives full facts on OCDM procedures and describes established community helicopter practices. For a copy, write COMMERCIAL DIV., HILLER AIRCRAFT CORP., PALO ALTO, CALIF.

(See page 44 for more Bulletins)

RIGID PLASTIC PIPE made of

CYCOLAC.

THE TOUGH, HARD **ABS** PLASTIC
from BORG-WARNER

OUT-PERFORMS CONVENTIONAL PIPE IN VITAL MUNICIPAL INSTALLATIONS!

Ideal for main-to-house water lines • Underground sprinkler systems • Domestic gas • Electrical conduit • N.S.F. approved

This is America's truly *versatile* pipe — offering you a combination of advantages never before available in one piping product. Cycolac, the remarkable ABS plastic, has no equal for all-around serviceability. Miles of rigid plastic pipe made of Cycolac are now in use — serving and saving in cities like yours!

Write for the name of your nearest supplier

10 Reasons why you're right with Rigid Pipe made of CYCOLAC!

1. **HARD AND TOUGH — SUPERIOR TENSILE STRENGTH.** Excellent burst-resistance, even at high temperatures.
2. **LIGHTWEIGHT.** Easy to carry — approximately ⅛ the weight of comparable iron.
3. **RUSTPROOF, ROTPROOF.** Unharmed by soil acids — never corrodes or scales.
4. **NON-TOXIC.** Approved for potable water by the National Sanitation Foundation.
5. **CHEMICALLY RESISTANT.** Carries waste, salt solutions, organics with wet corrosives.
6. **LOW FRICTION LOSS.** Mirror-smooth interior surfaces insures higher rate of flow.
7. **VERSATILE.** Used for process piping — water systems — natural gas — electrical conduit.
8. **EASILY JOINED WITH METAL.** Used to replace corroded sections or to line metal pipe.
9. **EASY TO INSTALL.** Quickly jointed — less ditching — no costly handling equipment.
10. **LOW IN COST.** Less than most metal or plastic pipe — greater serviceability.

PACESETTER IN
Marbon CHEMICAL
SYNTHETIC RESINS

DIVISION of BORG-WARNER
WASHINGTON, W. VA.

also represented by:

WEST COAST: Harwick Standard Chemical Co., Los Angeles, Cal.
CANADA: Dillons Chemical Co. Ltd., Montreal & Toronto
EXPORT: British Anchor Chemical Corp., New York

BW

Marbon

MOVING X MARK

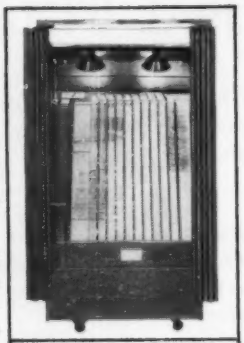
for better elections

Only the Shoup Voting Machine has the moving **X** mark which moves into view directly alongside the candidate's name as each voting lever is operated. This protects the voter against error, and there is no doubt or confusion about which candidates he has voted for.

Should the voter make an error while voting, it is immediately apparent, and can be corrected simply by returning the lever to its original position which removes the **X**. He can then turn the lever for the candidate of his choice. The final **X**s remain visible until the ballot is completed.

Propositions can be voted with the same simplicity. The **X** clearly shows the voter opinion, for or against. When the vote is registered, the voting levers return to upright position clearing the ballot of **X** marks before the curtains reopen.

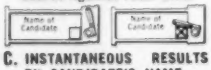
Shoup Voting Machines are designed to fill every ballot requirement and comply with the election laws of all states. They are the only voting machines that duplicate the traditional vertical paper ballot with which voters are familiar. They are fool-proof and fraud-proof, reduce voting costs, and insure greater speed and accuracy of results. Impartial surveys prove the Shoup Voting Machine superior . . . more perfectly designed and constructed to meet the requirements of the voting public. That's why more and more communities, from the smallest to the largest, are using Shoup Voting Machines for better elections.



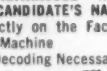
The ABC's of Superiority...

A. THE VERTICAL TYPE BALLOT (see illustration)

B. THE MOVING X MARK – Visual Proof of Selection – Guards Against Voter Error



C. INSTANTANEOUS RESULTS BY CANDIDATE'S NAME Directly on the Face of the Machine No Decoding Necessary



28 States Already Use Shoup Voting Machines

SHOUP

THE SHOUP VOTING MACHINE CORPORATION

EXECUTIVE OFFICES: 41 E. 42nd St., New York 17, N.Y. • SALES OFFICES: 1701 West End Ave., Nashville 3, Tenn.

the voting machine that looks like a ballot

FREE catalogs

Write directly to the address given or use the Post Card on page 51.

Speeds Engineering and Drafting Operations

132 The Cook County, Ill. Highway Department is now speeding engineering and drafting routines by using an engineering drawing system that makes possible the saving of valuable time and assures greater efficiency. For full facts, write RECORDAK CORP., 415 MADISON AVE., NEW YORK 17, N. Y.

Light Hauling Vehicles

133 Extreme economy of operation, compact size for use inside the plant as well as on the street and ruggedness are said to characterize the two new 1960 gasoline and electric powered Trucksters announced by CUSHMAN MOTORS, 922 N. 21st ST., LINCOLN, NEBR. For complete information on these versatile light hauling vehicles, write the company.

Improved Crawler Tractor

134 Major improvements, production and mechanical advantages of the new D9 Series E tractor and features of the new Cat power shift transmission are given in a new six-page brochure released by CATERPILLAR TRACTOR CO., PEORIA, ILL. Request *Form* 33544A.

Bio-Oxidation Aerator

135 Diagrams and charts in a new 6-page bulletin released by THE PERMUTIT CO., a division of PFAUDLER PERMUTIT INC., 50 W. 44TH ST., NEW YORK 36, N. Y., illustrate various design and operating features of the Permaerator, a high efficiency mechanical-turbine aerator developed primarily for use in the activated sludge process.

New Fire Hydrants

136 The two new fire hydrants for municipalities introduced by KENNEDY VALVE MFG. CO., ELMIRA, N. Y., are the K-10 and K-11, respectively, a standard model and a Safetop model with safety breakable section which, on smashing impact, breaks cleanly apart without loss of water or damage to major hydrant parts. Both are described in *Bulletin* 591.

Restore Clogged Water and Sewer Mains

137 Water and sewer mains shrinking? Wondering how best to restore them to original flow capacity? Then you'll want facts, surveys and estimates on your problem from experienced crews. Such information is available free from NATIONAL POWER RODDING CORP., 1000 S. WESTERN AVE., CHICAGO 12, ILL. Write for free catalog.

Easier, More Economical Snow Removal

138 Snow removal operations can be accomplished with less effort and greater rapidity when snow plows are lifted and lowered automatically from inside the cab. An illustrated brochure on hydraulic power controls that assure dependable snow plow action can be obtained from MONARCH ROAD MACHINERY CO., 1331 MICHIGAN ST., N. E., GRAND RAPIDS 3, MICH.

(See page 48 for more Bulletins)

Buy on FACTS that benefit YOU

...and you'll buy the

GALION 160 Grader !

STANDARD EQUIPMENT INCLUDES . . .

- ☐ 160 hp direct-starting diesel engine.
- ☐ Power balanced to weight—rear end 20,200 lbs., front end 8,320 lbs., provides the utmost in tractive effort and front end stability.
- ☐ Combination manual with hydraulic power steering.
- ☐ Four-wheel hydraulic brakes.
- ☐ Tires 14.00 x 24, 10 ply, same size front and rear—interchangeable.
- ☐ Hydraulic power shift moldboard (13' x 29" x ¾").
- ☐ Front wheel spindles (3⅜" x 2") designed for large tires.
- ☐ Positive-acting leaning front wheels. Simple maintenance—only two grease fittings to service.
- ☐ Full hydraulic control.
- ☐ Eight-unit control manifold for convenient installation of extra attachments.
- ☐ Two-stick shift mechanism for the 6-speed constant-mesh transmission.
- ☐ Full-floating rear axles.
- ☐ Extra-heavy frame, weight per ft. 134 lbs.

Check the features included as STANDARD equipment on the grader you may have been thinking of buying. Then ask yourself—"Which offers me the MOST for my money?—GALION Model 160."

Write for literature.

THE GALION IRON WORKS & MFG. CO.

General and Export Offices Galion, Ohio, U.S.A.

Cable Address—GALIONIRON, Galion, Ohio

GALION ESTABLISHED 1907

MOTOR GRADERS & ROLLERS

the Zeiss Automatic Level

For 7 years now, in U.S. and Canada, contractors of every size, industrial, government and military field men have *tried* and *proved* the Zeiss automatic level (K&E NP5028). They all concur: it's faster to use, far simpler . . . and far more accurate.

With the Zeiss even a beginner can close with the speed and accuracy of a veteran. Rough level *just once* and go to work. Eliminated for good is the headache of constantly recentering a telescope bubble. The force of gravity does the job automatically, acting on a pendulum-suspended prism. Job time, on an average, is *cut in half!*

A book could be written about the success stories of this remarkable instrument. As a matter of fact, one has been . . . a fascinating collection of case histories from around the world. The book is full of worthwhile tips and techniques. It's free, and a copy can be yours in a week or so, if you write for it, today.

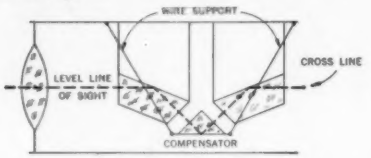
FOR YOUR FREE COPY

of the Zeiss level casebook, write to Keuffel & Esser Co., Hoboken, N. J., Dept. AC-12

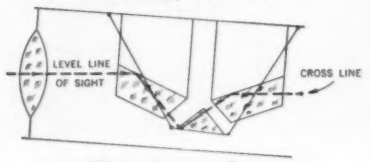
The Zeiss Automatic Level (K&E NP5028) is sold exclusively through K&E dealers.

How does the Ni 2 work?

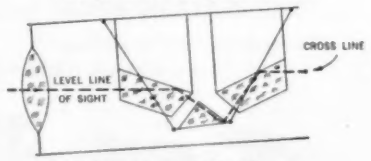
A *built-in compensator* . . . a lower prism suspended by specially treated fine wires . . . *automatically maintains a level line of sight* through the pull of gravity, as these illustrations explain.



Telescope horizontal



When telescope tilts up, compensator swings backward



When telescope tilts down, compensator swings forward

AUTOMATIC COMPENSATOR *ALWAYS* MAINTAINS A LEVEL LINE OF SIGHT

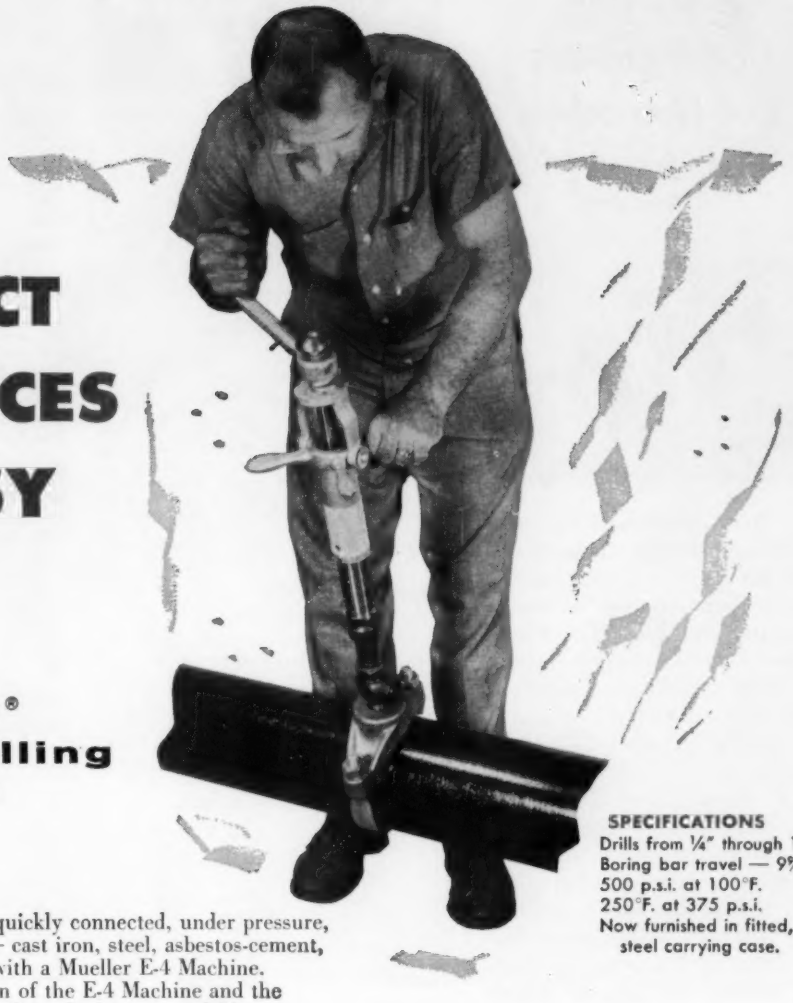
2024

K+E

KEUFFEL & ESSER CO.

NEW YORK • HOBOKEN, N. J. • DETROIT • CHICAGO • MILWAUKEE • ST. LOUIS • DALLAS • DENVER • SAN FRANCISCO • LOS ANGELES • SEATTLE • MONTREAL

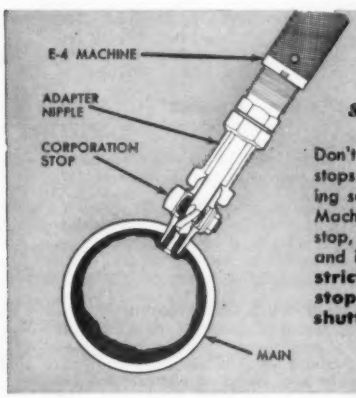
CONNECT SERVICES THE EASY WAY!



MUELLER® E-4 drilling machine

SPECIFICATIONS
Drills from ¼" through 1"
Boring bar travel — 9⅝"
500 p.s.i. at 100°F.
250°F. at 375 p.s.i.
Now furnished in fitted, steel carrying case.

Service lines are easily and quickly connected, under pressure, to any type of main — cast iron, steel, asbestos-cement, cement-lined or concrete — with a Mueller E-4 Machine. The simple, rugged design of the E-4 Machine and the great variety of drills and adapters available make it an extremely useful water works tool. Write for complete information.



clean corporation stops under pressure!

Don't abandon clogged corporation stops when cleaning mains and replacing service lines. Simply attach the E-4 Machine to the outlet of the installed stop, open stop, and drill out all deposits and incrustations as shown. **Full unrestricted flow of the corporation stop is quickly restored without shutting off the main.**

Just follow these simple steps:

1. Bolt a Mueller Service Clamp to main in desired position.
2. Install a Mueller Corporation Stop in clamp and open stop.
3. Attach E-4 Machine directly to outlet of corporation stop by using adapter nipple.
4. Advance drill through both open stop and clamp and drill into main.
5. Withdraw drill and close corporation stop.
6. Remove "E-4" and attach service piping to outlet of stop.

MUELLER CO. since 1857 SERVING the Water and Gas Industries QUALITY

MUELLER CO.
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles; In Canada: Mueller, Limited, Sarnia, Ontario

How can fire fighters get the edge on fires?

In Tulsa, Oklahoma, a modernized Gamewell Fire Alarm System gives fire fighters a real jump on fires. It alerts precisely the number of companies needed to fight a blaze . . . and permits them to respond to the alarm without even having to check its location!

When the alarm comes into the alarm center (above) the dispatcher merely checks a card file for company assignment. Then by radio he quickly and accurately dispatches the proper assignment of men and equipment. Code signal confirmation of the alarm is then transmitted to all stations. The efficiency of the new system will greatly benefit property owners in the city of Tulsa . . . faster response to each alarm will give the fire fighters an "edge" on the fire.

Tulsa's new Gamewell System now includes 264 street type boxes and 65 Master Boxes located in schools, public buildings, industrial plants, hospitals, and institutions. This rapidly expanding city is wisely protecting its growth. Are *your* community's fire alarm facilities up to date? A Gamewell Survey will answer this question. No obligation. Write THE GAMEWELL COMPANY, 1271 Chestnut St., Newton Upper Falls 64, Massachusetts.

Gamewell®

FIRST . . . WHEN SECONDS COUNT

MONEY SAVING *catalogs*

Write directly to the address given or use the Post Card on page 51.

For Engineering Typing

139 A method of using an electric typewriter for quick typing of symbols and equations needed in engineering is the subject of *Booklet* R-8964.6. The typist inserts the special type characters in seconds. Only the typeface is changed. (It snaps into place in one simple operation and is locked—or removed—with special magnetized tweezers.) Write REMINGTON RAND, 315 PARK AVE. S., NEW YORK 10, N. Y.

Municipal Castings Catalog

140 NEENAH FOUNDRY CO.'S full line catalog contains 168 pages of castings for municipalities, airports, highways. Manhole covers, drainage grates, catchbasins, gutter and airport inlets, floor grids and treads are included. As many as 15,000 patterns are now on hand for gray and ductile iron construction castings. For a copy of the catalog, write the company at 5445 N. Neva Ave., Chicago 31, Ill.

Prestressed Concrete Lighting Standards

141 An easy, low-cost drill, set, tamp method of installation readies these lighting poles for all electric work in less than 15 minutes. But for full facts and details on the wide range of attractive stress-spun Hy-Lite designs, write AMERICAN CONCRETE CORP., 5092 N. KIMBERLY AVE., CHICAGO 30, ILL. Request *Catalog* 400.

Area Floodlighting Made Easy

142 . . . is the title of a 16-page booklet that gives quick reference guides for selecting incandescent or mercury floodlights, general purpose or heavy duty types, and for determining how many floodlights are needed based on the size and area to be lighted. Footcandle charts and installation diagrams are included. For a copy of *Bulletin* 2719, write CROUSE-HINDS CO., SYRACUSE 1, N. Y.

Aerial Photography Catalog

143 The advantages of photogrammetry and aerial photography are explained in a new brochure issued by AMERICAN AIR SURVEYS, INC., 907 PENN AVE., PITTSBURGH 22, PA., whose range of services include topographic maps, route surveys, tax and property maps, stockpile inventories, industrial plant maps and aerial photography, mosaics and atlas sheets.

Power Lawn Mowers and Trimmers

144 A nationwide survey shows the average life span of these mowers to be 3000 cutting hours (25 week seasons), one-third longer than mowers of comparable sizes. Their flexibility permits them to cut around overhanging shrubbery with the same ease with which they trim spacious lawn areas. For full facts, write LOCKE MOWER DIV., LOCKE STEEL CHAIN CO., 1315 CONNECTICUT AVE., BRIDGEPORT 1, CONN.

Longer-Lasting Traffic Lines

145 A technical data sheet giving standards for application of reflectorized thermoplastic pavement marking material has been issued by CATAPHOTE CORP., TOLEDO 10, OHIO. The material is available under the trade name Catatherm, in white and federal yellow. It is guaranteed to provide not less than nine times the useful service of a good quality paint stripe, and retains maximum reflectivity.

Versatile Wheel Tractor

146 CONSTRUCTION EQUIPMENT DIVISION, NAPCO INDUSTRIES, INC., 834 N. 17TH ST., MINNEAPOLIS 11, MINN., has issued *Brochure* No. CT-1959 on the Napco Crab 4-wheel drive, 4-wheel steer industrial tractor to replace the one released when the Crab was first the Crab with its many attachments and introduced. It includes action photos of complete specifications. Address requests to R. J. RAYBACK, SALES MGR.

New Line of Surveying Transits and Levels

147 The Path line of surveying instruments includes 4" and 6" transits, transit levels, dumpy levels, eye levels, tilting levels and pocket levels. All use Japanese lenses and are said to provide superior definition of viewed objects; distinct, powerful magnification of images, and resolute, unwavering accuracy on targets. For full facts, write CHARLES BRUNING CO., INC., 1800 WEST CENTRAL RD., MOUNT PROSPECT, ILL.

Cab-Actuated Materials Spreader for Ice Control

148 This spreader, Model TG, fits any standard dump body 6½' to 8' in width. With it you can choose spreading width from 5' to 40' and regulate flow of materials merely by touching a fast-acting hydraulic control in the cab. For descriptive literature giving full facts, write HIGHWAY EQUIPMENT CO., 633B "D" AVE., N. W., CEDAR RAPIDS, IA.

Reverse-Mounted Loader Has Self-Loading Bucket

149 The RL-400 Series, recently added to the HENRY MFG. CO. line, is primarily for stockpile work and for mounting on utility tractors. Its 1-yard, self-leveling bucket loaded by hydraulic power does not depend on the traction of the tractor. Lifting capacity to full height is 3000 pounds; breakaway capacity, 400 pounds. *Bulletin* RL-1059 gives full facts; write the company at P. O. BOX 521, TOPEKA, KAN.

For More Efficient Municipal Refuse Collection

150 A new, fully descriptive 12-page brochure has been issued on refuse collecting with the Daybrook Power Packer and Sani-Tainer Method utilizing 1, 2 and 3 cubic yard containers. A highlight of *Catalog* Section 5A is the detailed illustrations of Daybrook's new principle of complete compaction of refuse materials that increases collection efficiency by 20%. Write DAYBROOK HYDRAULIC DIV., YOUNG SPRING & WIRE CORP., BOWLING GREEN, OHIO.

More Effective Ice Control

151 The latest information on calcium chloride-rock salt mixtures for ice control, as well as notes on treated abrasives, are available in booklet form from COLUBBIA-SOUTHERN CHEMICAL CORP., ONE GATEWAY CENTER, PITTSBURGH 22, PA. Properties, adaptability, storage, mixing methods, recommendations for various storm conditions are all included.

Significant Truck Development

152 The 1960 Chevrolet trucks feature a totally new suspension system. According to explanatory literature, it absorbs jolts and jars, eliminates I-beam shimmy and wheel fight, adds extra miles to the truck's working life and enables the truck to move along with maximum payloads at higher safe cruising speeds. For details, write CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICH.

(See page 50 for more Bulletins)

Now there are three sizes!

PRESENTING THE NEW 1″ SIZE

ROCKWELL SEALED REGISTER METER

Another Milestone in Magnetic Metering. Now you can meter 1″ services with the same exclusive advantages proved nation-wide by thousands of smaller size Rockwell Sealed Register meters. These include a powerful magnetic drive which eliminates all need for a stuffing box—a hermetically sealed register that never fogs or corrodes and is always easy to read—a construction that's easy and economical to repair . . . a construction in which only two parts operate in water.

The larger the meter size, the greater the opportunity for revenue loss through faulty performance; the more costly become repairs and meter shop operations. That's why Rockwell has invested heavily to extend the Sealed Register meter line. Never in history has there been a meter design which required so little maintenance and never one that exactly suited the needs expressed by practical water works operating men. Just try them and see. Write to Rockwell Manufacturing Company, Pittsburgh 8, Pa.

SEALED REGISTER METERS

another fine product by

ROCKWELL

FREE catalogs

Write directly to the address given or use the Post Card on page 51.

New Rubber Waterstop Splices in 6 minutes

153 A 4-page descriptive folder reports that splicing time for this Kwik-Seal waterstop is 5 times faster than with former methods. The splice is chemically bonded, eliminating heat, vulcanizers and molded parts. The waterstop is used to prevent seepage and leakage whenever concrete is used. Write GATES RUBBER CO., 999 S. BROADWAY, DENVER 17, COLO.

Permits Outdoor Reading and Servicing of Water Meters

154 A new "Meterminder" water meter box that reduces meter reading and servicing time, protects meter and yoke from mechanical damage and eliminates call backs by meter readers has been announced by HANDLEY-BROWN CO., 2102 BROOKLYN RD., JACKSON, MICH. It is available in two models and is designed principally for basementless homes.

Two New Front-End Loaders

155 Newest in the expanding Trojan tractor shovel are the 134 and 164. The former is a 1½-yard machine with 8000-pound lifting capacity, 2'5" forward reach, 8'8" dump height. The latter is a 1½-yard loader with 10,000-pound lifting capacity, 8½' dump height and 2¾' forward reach. Each is available with gas or diesel power. For full story, write THE YALE & TOWNE MFG. CO., TROJAN DIVISION, BATAVIA, N. Y.

Plastic Pipe for Water Works Service

156 Uscolite pipe is engineered to handle highly corrosive fluids. It is light in weight, yet has high impact strength, and imparts neither taste nor odor nor discoloration. It is used successfully in municipal water treatment plants where it is necessary to introduce strong purifying chemicals into the water. For full facts, write MECHANICAL GOODS DIV., ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Cross-Ventilated Sewage Filter Block

157 Engineered for maximum ventilation and fast-run-off, Translot filter block has 3 lateral slots and 3 large, smooth-surface ducts (4 times the opening area of other types of filter block). Tests show it has a high safety factor. It conforms to current A.S.T.M. specification C-159-55, covering unglazed vitrified clay block for trickling filters. For technical literature, write TEXAS VITRIFIED PIPE CO., MINERAL WELLS, TEXAS.

Parking Meter Thwarts Vandals

158 DUNCAN PARKING METER, DIVISION OF MOTOR PRODUCTS CORP., 835 N. WOOD ST., CHICAGO 22, ILL., specifically developed this parking meter to combat the increasing and costly destruction of parking meter equipment and theft of meter revenue. Confident that it can give vault-like protection, the company (with each meter order) will issue and pay for an insurance policy indemnifying the purchasing city against physical loss due to vandalism. Full details are available from the company.

World's Largest Dual Fuel Engine

159 . . . and eight other Nordbergs have helped the Ponca City, Okla. municipal power plant make a net profit of almost $1 million in one year by producing over 55 million kilowatt-hours at a production cost of 5.67 mills per kwhr. For full facts on this story, write NORDBERG MFG. CO., MILWAUKEE 1, WIS.

Measures, Controls Water Treatment

160 Are there advantages in using a single, responsible source to furnish instrumentation, control and chemical feeding equipment for a water filtration plant? Literature being offered by B-I-F INDUSTRIES, UTILITIES SALES, 358 HARRIS AVE., PROVIDENCE 1, R. I., considers this question in terms of coordination, integration, efficiency, operating economy and system reliability.

Automatic Rotary Broom Winder for Street Sweepers

161 The Ben-Ko-Matic can strip and make an 8' broom in less than 20 minutes. It winds any and all cores, including duPont "Tynex" 3 nylon filament and the Wayne 200, up to 10' in length. And it will wind .028" diameter crimped steel gutter wire in with fibre bristles. For literature, write BEN-KO-MATIC, INC., 8028 N. JERSEY ST., PORTLAND 3, ORE.

Durable Traffic Markings

162 This thermoplastic traffic marking material applies with speed, dries almost instantly, is highly visible and durable. It meets the strict standards of safety demanded by the new Interstate Highway System. For a brochure showing latest installations of Perma-Line and specifications, write VEON CHEMICAL CORP., 22-09 BRIDGE PLAZA NORTH, LONG ISLAND CITY 1, N. Y.

Smooth-Bottom Aluminum Float for Concrete Finishers

163 This new, extruded aluminum float has a 6' nonhand-cramping magnesium handle, flexible enough to "jitterbug" or bring "fat" to the surface of the slab and stiff enough to give long-wearing, efficient and floating action. The float is reported to be exceptionally light and strong. For literature, write GOLDBLATT TOOL CO., 1910 WALNUT ST., KANSAS CITY 41, MO.

Help for Urban Planners

164 . . . as offered by THE UNION METAL MFG. CO., CANTON 5, OHIO, is in the form of Monotube lighting poles, overhead sign supports, and foundation piles to help provide increased driver safety, improved traffic flow and economy in various phases of urban highway construction. For details, write the company.

Simplified Connections for Water Pipe

165 The efficiency, economy and foolproof operation of APCO Altite Joints for cast-iron pipe, as well as the ease with which they can be installed, are described in literature available from ALABAMA PIPE CO., ANNISTON, ALA.

More Versatile Pipe Locator, Leak detector

166 The new transistorized "Dualtronic" LC-5T is a lighter, more sensitive instrument and has been designed specifically for municipal and water company use. It will pin-point pipes, cables, mains, laterals, valves, risers, and manhole covers and detect water leaks. For full details, write THE GOLDAK CO., INC., 1544 W. GLENOAKS BLVD., GLENDALE 1, CALIF.

Submersible Sewage and Sump Pumps

167 . . . available in a choice of two motors—1750 rpm and low speed 1140 rpm for longer life, less wear and improved nonclog characteristics —and with a choice of two controls (conventional float switch or micro switch) are the subject of *Bulletins* SE-860 and SE 865, available from WEIL PUMP CO., 1518A N. FREMONT ST., CHICAGO 22, ILL.

Plastic Casing for Water Wells

168 A catalog sheet recommends this plastic well casing for jobs on which galvanized sheet metal casing is generally used, and for depths not in excess of 300 feet. The casing is high in strength, semi-rigid, lightweight, easy to cut and perforate, doesn't rust or corcode, and when joined with standard plastic couplings and cement makes a permanent water-tight chemically fused joint. Write SOUTHWESTERN PLASTIC PIPE CO., MINERAL WELLS, TEXAS.

Sealed Electrode Floatless Pump Controller

169 *Bulletin* 128-A reports that the Sealtrode offers all the advantages of other floatless controllers plus these of being sealed: electrodes never become insulated and coated with grease, oil or soap and aren't affected by corrosive elements in sewage and drainage water; no moving parts in liquid; low maintenance and low original costs. Write CHICAGO PUMP CO., 622 DIVERSEY PARKWAY, CHICAGO 14, ILL.

Solve City Mapping Problems

170 A new brochure describes a practical plan that enables cities both small and large to have up-to-the-minute aerial photo maps for general planning or topographic maps for specific engineering projects on a basis that meets their needs and budget. Request "Pay As You Grow Plan;" write, AERO SERVICE CORP, PHILADELPHIA 20, PA.

Redesigned Pipe Pushers

171 Descriptive literature announcing the 1960 model "Speed-Thru" pipe pushers manufactured by MERCURY HYDRAULICS, 1632 WAZEE ST., DENVER, COLO., emphasizes their higher speed, shorter (12") stroke, pushing 1 foot in 11 seconds, greater pushing accuracy. The pushers can be installed in an operating trench as short as 52 inches, come in three sizes capable of gripping up to 4" I. D. pipe, and with thrusts up to 110,000 pounds.

All-Purpose Insect Control Machine

172 A combination machine that may be used for air-blast spraying, high volume spraying with a hose, dusting, or pellet broadcasting offers substantial opportunity for use to cities for controlling both shade tree infestations as well as mosquito and fly breeding. For descriptive literature, write BESLER CORP., 4053 HARLAN ST., EMERYVILLE, OAKLAND 8, CALIF.

Infilco's New Aerator

173 *Bulletin* 6620 will acquaint you with the Vortair aerator, a new low-cost means for introducing atmospheric oxygen into an aeration basin or lagoon at any desired rate. Power consumption is conservative, as field data indicate that it is possible to dissolve 2.5 to 3 pounds of oxygen per hour per horsepower. Write INFILCO INC., TUCSON, ARIZ.

(See page 54 for more Bulletins)

Postage Will be Paid by Addressee

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BUSINESS REPLY CARD
FIRST CLASS PERMIT No. 281, SEC. 34.9 P. L. & R., NEW YORK, N. Y.

THE AMERICAN CITY MAGAZINE
470 PARK AVENUE SOUTH
NEW YORK 16, N. Y.

DO YOU HAVE A WATER SUPPLY PROBLEM?

If you need information on any type of municipal service or equipment, these reply cards will get action in a hurry.

To THE AMERICAN CITY's Catalog Supply Department:
Please send me literature on items numbered as follows, starting on page 38

100	112	124	136	148	160	172	184	196	208	220
101	113	125	137	149	161	173	185	197	209	221
102	114	126	138	150	162	174	186	198	210	222
103	115	127	139	151	163	175	187	199	211	223
104	116	128	140	152	164	176	188	200	212	224
105	117	129	141	153	165	177	189	201	213	
106	118	130	142	154	166	178	190	202	214	
107	119	131	143	155	167	179	191	203	215	
108	120	132	144	156	168	180	192	204	216	
109	121	133	145	157	169	181	193	205	217	
110	122	134	146	158	170	182	194	206	218	
111	123	135	147	159	171	183	195	207	219	

I would also like to receive manufacturers' booklets on.....
.....
.....
.....

Name: (Please Print).....
Title:.....
Address:.....
..... 12-59

A Listing of Your Business Connection is Important

To THE AMERICAN CITY's Catalog Supply Department:

Please send me further information on products described in "Purchasing News" section beginning on page 185 as circled below:

733	738	743	748	753	758
734	739	744	749	754	759
735	740	745	750	755	760
736	741	746	751	756	761
737	742	747	752	757	762
					763

I would also like to receive manufacturers' booklets on.....

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Name: (Please Print).....

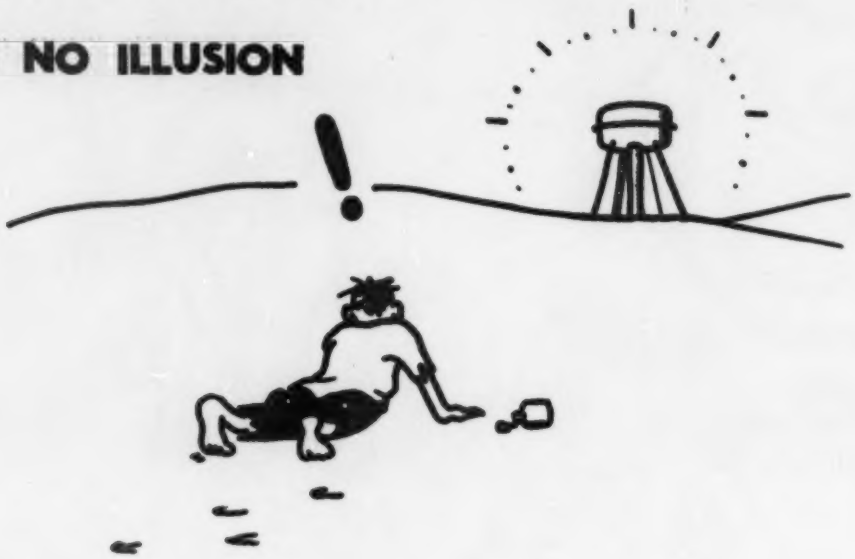
Title:.....

Address:.....

..... 12-59

A Listing of Your Business Connection is Important

IT'S NO ILLUSION



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THE AMERICAN CITY MAGAZINE
470 PARK AVENUE SOUTH
NEW YORK 16, N. Y.

Save time and effort by using these reply cards when you want additional information on any product or service mentioned or advertised in this issue.

Protect against accidents like this!

Use straight Morton Rock Salt—the most effective way to help keep streets, freeways and tollroads safer in winter

Straight Morton Rock Salt does the job abrasives and Salt mixed with abrasives can't do to help prevent accidents caused by ice and snow. Morton Rock Salt gives *abrasive traction* against skidding even before the salt starts to melt the ice. Rock Salt crystals are larger than other commonly used ice melting chemicals and *penetrate ice deeper* with a corkscrew action—not just melt surface ice. Due to Rock Salt's better penetration, it reaches the pavement fast and quickly *melts* the bond between ice and the street surface.

Morton Rock Salt is safe, clean, economical

Straight Morton Rock Salt is non-toxic. It does not damage animals' paws, rubber, fabrics, leather, asphalt, brick or properly seasoned concrete. It will not clog sewers or leave a rutted, dirty pavement as will sand or cinders. What's more, Rock Salt melts *more ice at lower cost* at any temperature above 8° F. than any other commonly used ice melting chemical.

Send for more information today!

☐ Please send me your free book on ice and snow removal.

☐ I would like a Morton representative to advise me on how best to stockpile Morton Rock Salt.

Name_____

Title_____

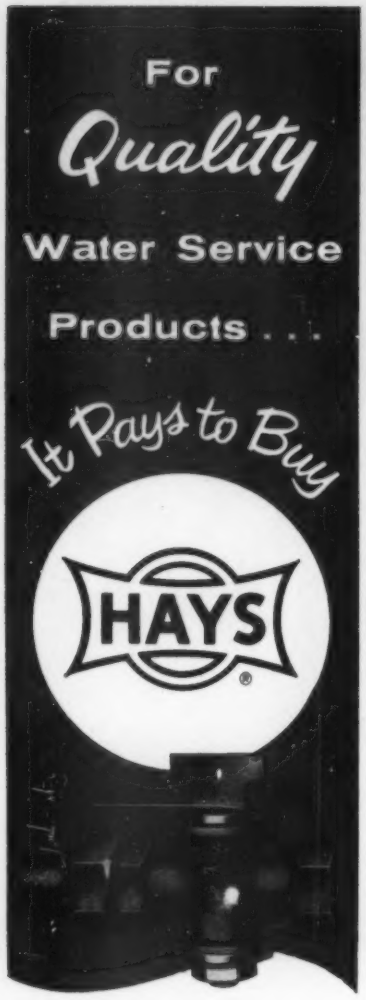
Address_____

City_____ Zone____ State_____

MORTON SALT COMPANY

INDUSTRIAL DIVISION

Dept. AC-12 110 No. Wacker Drive, Chicago 6, Illinois



CURB STOPS

•

One of a complete line of Water Service Products

GENERAL PRODUCTS DIVISION

HAYS MFG. CO.

ERIE, PA.

MONEY SAVING *catalogs*

Write directly to the address given or use the Post Card on page 51.

For Sludge Dewatering, New Cloth Discharge Filter

174 . . . called the "Cloth Discharger," is recommended for use in sewage purification plants. Announcement literature reports that it overcomes cloth blinding, which necessitates frequent and expensive changes of filter cloth and results in expensive delays and lowered drum filter capacity. For full facts, write PETERSON FILTERS AND ENGINEERING CO., SALT LAKE CITY, UTAH.

Wheel Loader Offers Choice of Transmission

175 The TL-14 TRACTOLOADER with full power-shift transmission features single-lever speed and direction control, which makes possible changing gears on the go. With Tractomatic transmission, the TL-14 offers ease of operation, reliability and economy. For full facts, write ALLIS-CHALMERS CONSTRUCTION MACHINERY DIV., MILWAUKEE 1, WIS.

Easily Locates Pipes, Valves and Cables

176 This transistorized unit contains many features not found on other pipe locators that contribute to its sensitivity and ease of operation. And its round anodized aluminum handle is guaranteed not to warp and is much lighter and less rigid. For full details and specifications on Model 174, write GARDINER ELECTRONICS CO., 2545 E. INDIAN SCHOOL RD., PHOENIX, ARIZ.

Improved Water Meter Register Box

177 An improved sealed metal register box for ⅝" x ¾" and ⅝" x ½" American water meters is now being offered by BUFFALO METER CO. as optional equipment. It is said to combine the advantages of sealed-water-tight register compartment with the strength and ruggedness of a conventional metal register box. For descriptive literature, write the company at 2902 MAIN ST., BUFFALO 14, N. Y.

Film Highlights Use of Tractor Shovels in Municipal Work

178 A new 16mm 20-minute color-sound motion picture, "A Matter of Record", shows how municipalities usefully employ "Michigan" tractor shovels in sanitary landfill operations, snow removal, loading sand and gravel, backfilling trenches, ripping up old pavement, handling road shoulder maintenance, etc. To arrange for a showing, write CONSTRUCTION MACHINERY DIV., CLARK EQUIPMENT CO., PIPESTONE RD., P. O. BOX 5999, BENTON HARBOR, MICH.

Aluminum Sheet Increment Sign Bulletin

179 . . . describes large aluminum highway signs made up of demountable increment sheets. Signs are designed for simple field erection with minimum equipment. Many of these signs are currently being installed on Federal Interstate Highway projects in various sections of the nation. Design criteria for wind loading is approximately 100 mph. Write TRAFFIC & STREET SIGN CO., 84 FOUNDRY ST., NEWARK 5, N. J.

Parkway and Right-of-Way Mowing

180 A 4-page illustrated brochure from the SPECIALTY MANUFACTURING CO., P. O. BOX 7616, HOUSTON, TEXAS, describes the Model TKSR Terrain King, a 15' flexible mower especially designed for mowing parks, parkways and right-of-ways. Special features include back mower flaps, front mower shields, hydraulic tongue, hydraulic side section cylinders, double telescoping drive shafts, low-set cutting blades.

Photographic Paper Masters for Offset

181 The Ektalith method in two minutes can produce a master from practically any type of original—printed, typed, written or drawn on opaque or translucent paper—in enlarged or same size. One master will print hundreds of copies with the last legible as the first. All units will be sold through Kodak Ektalith dealers in major cities. For further information, write GRAPHIC REPRODUCTION SALES DIV., EASTMAN KODAK CO., 343 STATE ST., ROCHESTER 4, NEW YORK.

Warning Lights and Barricade Kits

182 . . . are the subject of literature available from PACIFIC MERCURY, 13232 LEADWELL, HOLLYWOOD PARK 1, CALIF. The lights are transistor neon or incandescent flasher warning and are said to be lighter, stay brighter and require less maintenance. The barricades are sturdy, but should they be damaged, permit impaired parts to be replaced easily and economically.

Irrigating Landscaped Areas

183 . . . such as golf courses, nurseries, cemeteries, parks, green areas along highways—with Transite irrigation pipe is viewed by *Bulletin* TR-212A in terms of planning, system design, handling, installation, flow characteristics, pumping, water conservation, maintenance and length of life. For a copy of this brochure, write JOHNS-MANVILLE, 22 E. 40TH ST., NEW YORK 16, N. Y.

Rotary Distributors for Secondary Sewage Treatment

184 *Bulletin* SM-1011 gives full facts on Eimco-Process rotary distributors, self-propelled mechanisms designed to provide uniform distribution of sewage or organic industrial wastes over the surface of a biological filter. Standard rate and high rate types are described. For a copy, write THE EIMCO CORP., DIRECT MAIL DEPT., P. O. BOX 300, SALT LAKE CITY 10, UTAH.

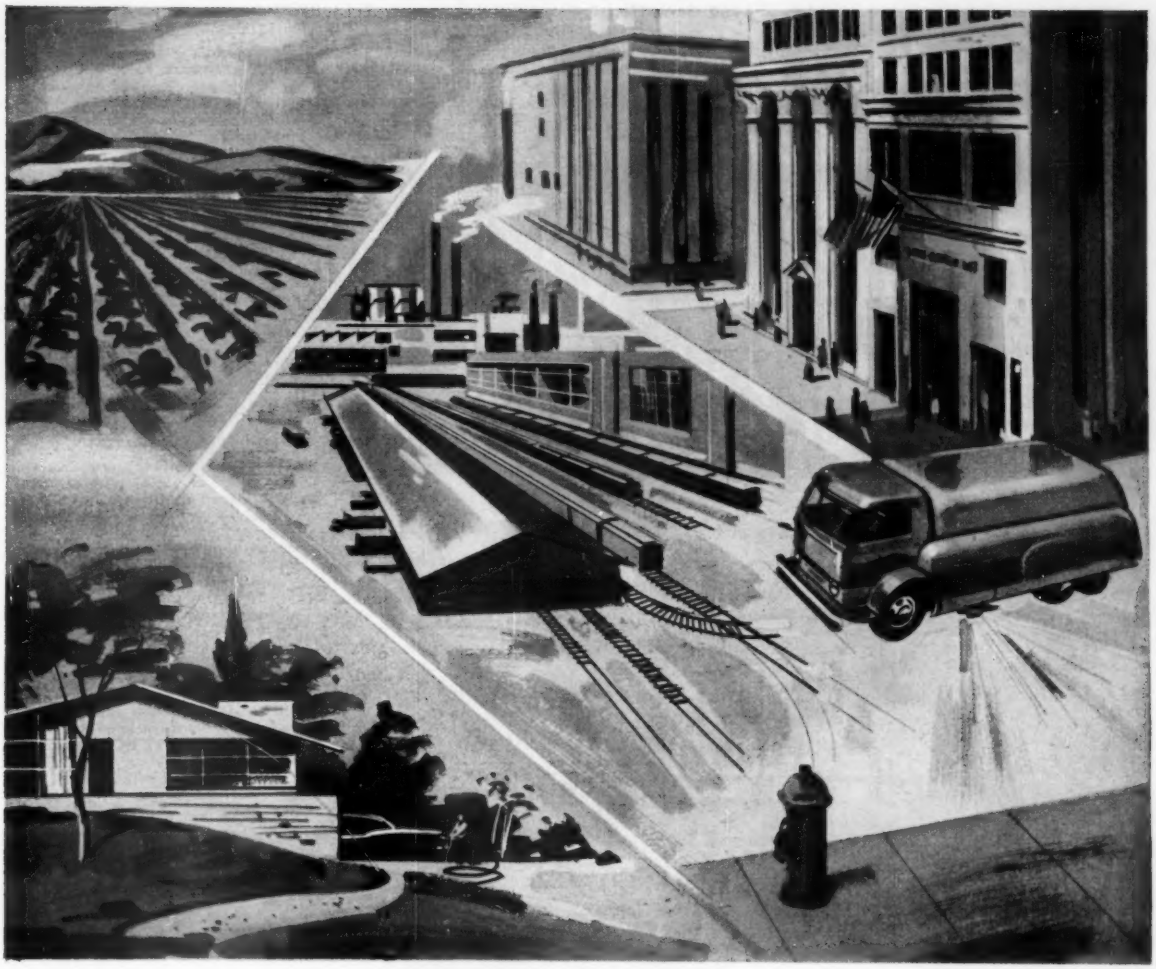
Picks Up, Carries, Dumps Stone and Debris

185 A mechanical stonepicker called PIXTONE that does all these chores efficiently and economically is the subject of a 4-page illustrated catalog issued by BRIDGEPORT IMPLEMENT WORKS, INC., 1438 STRATFORD AVE., STRATFORD, CONN., which also explains its suitability for beach maintenance work, grass seeding or landscaping and golf course operations.

Steel Grid Bridge Decking

186 A new 12-page catalog describing this steel mesh bridge flooring includes information on economy and safety features, tractional surfaces, tables of dimensions, weights, loads and spans for longitudinal and transverse installations, detail drawing, splices, typical specifications and illustrations. For a copy, write IRVING SUBWAY & GRATING CO., INC., 5030 27TH ST., LONG ISLAND CITY 1, N. Y.

(See page 56 for more Bulletins)



Lock Joint serves your community best

...IN THE HOME

INDUSTRY

AGRICULTURE

FIRE PROTECTION

SANITATION

An adequate supply of water, and an efficient means of disposing of excess water and wastes, are two of the most vital necessities to the comfort, health and growth of any community. LOCK JOINT CONCRETE PIPE provides the ideal material for implementing these important services. Dependable, rugged and economical, Lock Joint concrete pressure pipe, and sewer and culvert pipe will give trouble-free service for generations with the very minimum of maintenance requirements.

The large variety of designs available in Lock Joint Concrete Pipe make it possible to select the most economical pipe consistent with the specific requirements of any individual project, whether the pipeline be for water supply, water distribution, drainage, sewage or subaqueous installation.

LOCK JOINT PIPE CO.

East Orange, New Jersey

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo. • Perryman, Md. • St. Paul, Minn.

Pressure • Water • Sewer • **REINFORCED CONCRETE PIPE** • Culvert • Subaqueous

FREE catalogs

Write directly to the address given or use the Post Card on page 51.

Useful Water Works Tool

187 A Mueller E-4 drilling machine will enable you to connect service lines quickly, easily and under pressure to any type of main—cast iron, steel, asbestos-cement, cement-lined or concrete. You can also use it to clear corporation stops under pressure. For specifications and full facts, write MUELLER CO., DECATUR, ILL.

1960 Onan Electric Plant Catalog

188 *Catalog* F-146, listing more than 45 basic models of Onan gasoline and diesel engine-driven generator sets, includes the recently added line of high-capacity electric generating plants. For a copy, write D W. ONAN & SONS, INC., 2515 UNIVERSITY AVE. S.E., MINNEAPOLIS 14, MINN.

New, Automatic Traffic Striping Gun

189 This spray gun, designed for use on highway marking equipment, is diaphragm-operated. This eliminates the air cylinder and upper packing gland found on most spray guns and said to be a major cause for air loss in automatic spray guns. This new gun requires about 25% less air to operate at peak efficiency. For full facts, write KELLY-CRESWELL CO., XENIA, OHIO.

Economical Departmental Car

190 As many as 263 municipal and county governments, as well as 26 state governments have found the lark to be 12% lower in first cost, 19% lower in operating and maintenance costs. For descriptive literature and full facts on the complete line, write FLEET SALES DIV., STUDEBAKER-PACKARD CORP., SOUTH BEND 27, IND.

Steel Pipe and Allied Products

191 A review of 22-page "Facilities of Southern Pipe" will acquaint you with the welded steel pipe for transmission and distribution of water, gas and oil, corrugated metal culvert pipe, cylindrical steel piping, water well casings, fittings, joints and special products made by SOUTHERN PIPE CO., DIV. OF U. S. INDUSTRIES, INC., P. O. BOX C, AZUSA, CALIF.

Protective Coatings for Potable Water Storage Tanks

192 The purpose of *Bulletin* 57070 (A. I. A. File No. 25-B-2) is to help those engaged in the planning and design of steel structures and those charged with the development and maintenance of municipal water supply systems achieve effective control of corrosion in steel structures through specialized paint products and by systems of application. For a copy, write KING DIV., THE WILBUR & WILLIAMS CO., INC., 662 PLEASANT ST., NORWOOD, MASS.

More Durable Trucks

193 Municipalities that have made Ford Super Duty trucks a part of their work fleets know of their performance reliability and durability. The 1960 line, which offers several refinements, has been tested and evaluated by an independent research organization. Its findings provide proof that these trucks are even more durable. For full facts, and the name of the research organization, write FORD MOTOR CO., TRUCK DIVISION, P. O. BOX 658, DEARBORN, MICH.

Cast Iron Pressure Pipe in 20-foot Lengths

194 Water works operators and city engineers will appreciate how this longer length pipe, which implies over 10% fewer joints, can hold down substantially the labor costs involved in pipe installations. A complete line of Griffin-20 pipe is available in the 4" to 12" diameter size range, but for complete facts, write GRIFFIN PIPE DIVISION, GRIFFIN WHEEL CO., COUNCIL BLUFFS, IA.

Local Water Improvement

195 By sending a business letterhead request to THOS. F. WOLFE, MANAGING DIRECTOR, CAST IRON PIPE RESEARCH ASSN., 3440 PRUDENTIAL PLAZA, CHICAGO 1, ILL., you can obtain a complete portfolio that will help you stimulate action in your community for local water improvement and help answer some of your own local water problems.

Replacement Engine for Gravely Tractors

196 *Bulletin* S-228 contains detailed information and instructions regarding installation of Wisconsin BKN replacement engines for Gravely tractors. The BKN is rugged and field-proven. It is designed to start fast, work steadily, even in extreme temperatures, and has extra load-lugging power. For a free copy of this catalog, write WISCONSIN MOTOR CORP., DEPT. AM, MILWAUKEE 46, WIS.

(See page 58 for more Bulletins)

The sign of safety

The Image of CF&I—a giant steelman—provides positive protection for buildings and property with a Realock Chain-link Fence. This strong, yet attractive, fence guards playing children against stray animals and traffic . . . insures schools, playgrounds and other sites against acts of vandalism, arson and burglary.

Heavily galvanized *after* weaving, the tough metal fabric of a Realock Fence is weather-resistant. Virtually rust-proof, it gives many years of maintenance-free service. Another feature is the sturdy posts which are set in concrete.

Realock Fence is available in a selection of types—with or without barbed wire tops, in heavy steel or lightweight aluminum construction. Realock Fence is also ideal for baseball backstops, tennis courts and athletic fields where it is desirable to separate participants from onlookers.

A nearby Realock representative will be glad to give you a free estimate at no obligation. He's listed in the classified telephone directory, so call him today.

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Buffalo, New York

CF&I STEEL

REALOCK FENCE
THE COLORADO FUEL AND IRON CORPORATION
BRANCHES IN ALL KEY CITIES 6927

Mr. Mayor! Mr. City Commissioner! Mr. City Engineer!

Proved PERFORMANCE—Not Promises Backs CAST IRON PRESSURE PIPE

Your taxpayers have entrusted you with a decision—long-range in nature and far-reaching in consequences—to purchase pipe for your community's water system addition. Whether you borrow money or use current funds, you can't afford to take a chance on pipe that is unproven, with many failures in less than 20 years.

CAST IRON PRESSURE PIPE

Has Established Its Superiority With Many Records of Service Like These:

at MONTREAL since 1816 ——	144 YEARS
at LYNCHBURG since 1828 ——	132 YEARS
at PHILADELPHIA since 1830 ——	130 YEARS
at RICHMOND since 1831 ——	129 YEARS
at BALTIMORE since 1834 ——	126 YEARS
at ST. LOUIS since 1834 ——	126 YEARS
at READING since 1834 ——	126 YEARS
at HUNTSVILLE since 1836 ——	124 YEARS
at LANCASTER since 1836 ——	124 YEARS

If you want more proof, we can supply it. Sixty-eight cities are still using Cast Iron Pipe more than 100 years old. Join the Century Club! Safeguard your city's welfare with the only pipe that has stood the test of time.

This advertisement is published in the interests of the Cast Iron Pressure Pipe Industry by .....

WOODWARD IRON COMPANY

Since 1882

WOODWARD, ALABAMA

PERMA-LINE

This is what makes thermoplastic PERMA-LINE different from old fashioned marking methods: *It's there when you need it most,* whatever the season.

For long lines or crosswalks, in any climate, PERMA-LINE is unsurpassed for high visibility, durability and *guaranteed* safety protection.

PERMA-LINE applies with amazing speed. It dries almost instantly, without disrupting traffic. That's why modern, all-season PERMA-LINE—and only PERMA-LINE—can meet the strict standards of safety demanded by the new Interstate Highway System.

For economy and permanence, Traffic Engineers know: "Whatever the season, if there is a reason for *any* safety marking, there is a better reason for PERMA-LINE."

perma-line

VEON CHEMICAL CORPORATION • 22-09 BRIDGE PLAZA NORTH • LONG ISLAND CITY 1, N.Y.

For your free copy of our brochure showing latest installations and specifications, return this coupon.

■ NAME _____ TITLE _____

■ ADDRESS _____

■ CITY _____ STATE _____

MONEY SAVING *catalogs*

Write directly to the address given or use the Post Card on page 51.

New Automatic Parking Control

197 The PARCOA DIVISION OF JOHNSON FARE BOX CO., 4619 N. RAVENSWOOD AVE., CHICAGO 40, ILL. has introduced a new automatic parking system that prevents error and lost revenue. It is especially designed for flexible operation and can be adapted for use in municipal parking lots. For descriptive literature, write the company.

Transistorized Power Megaphone

198 The manufacturer of the rugged, 3¼-pound Falcon Chief, which gives up to 6000 two-second amplified messages from standard replaceable battery and clearly projects the human voice up to ½-mile, is offering free an informative booklet entitled "Sounds for Safety". For a copy, write FALCON ALARM CO., INC., DEPT. AC, SUMMIT, N. J.

Simplifies, Speeds Municipal Accounting

199 When you build municipal or county record-keeping procedures around a National Cash Register System, time is saved, payroll costs are considerably reduced, and efficiency is increased. For full facts—on the System and its components—write THE NATIONAL CASH REGISTER CO., DAYTON 9, OHIO.

Trees for Streets and Parks

200 THE COLE NURSERY CO., PAINESVILLE, OHIO, which offers 360 varieties of trees, evergreens and deciduous shrubs for municipal landscaping needs, has developed a whole new family of hardy, graceful trees. Each is said to have distinctly different characteristics of form, color and growth and is said to be adaptable to almost any soil or climate.

Sanitary Sewer Cleaning

201 For information on a bucket sewer-cleaning machine that quickly brings deposits directly from the sewer to the truck, eliminates the extra step of shoveling deposits from street to truck, and cleaning up the street afterward, write FLEXIBLE INC., 3786 DURANGO AVE., LOS ANGELES 34, CALIF. Request the "Truck-Loder Story".

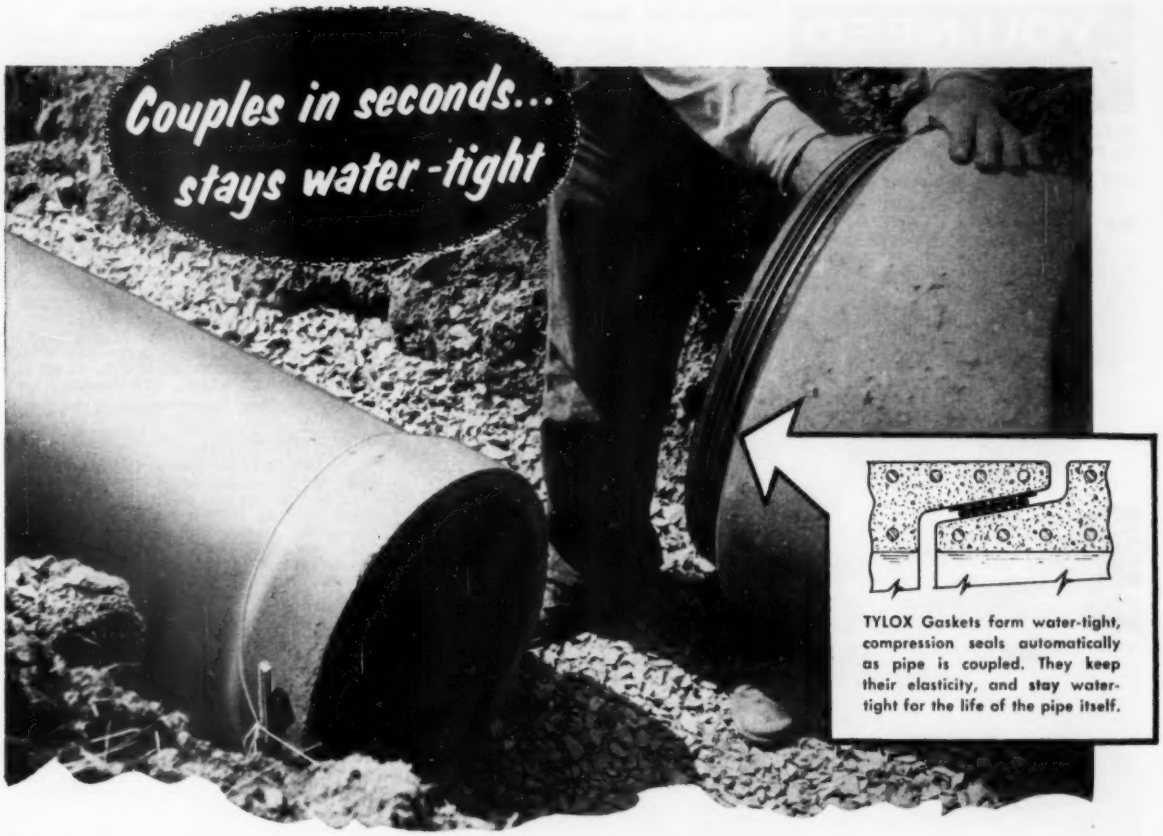
Makes Sewage Pipe Watertight

202 For detailed engineering data on gaskets for every sewage purpose—Buna-N for oil content sewage, natural rubber for common sewage, neoprene for acid content sewage—write PRESS SEAL GASKET CORP., P. O. BOX 482, R. R. 6, COVINGTON RD., FORT WAYNE, IND.

L-M Luminaires Offered in Six Light Patterns

203 L-M's Suburbanaires and PTL Post Top Luminaires are now offered with an IES Type IV refractor, bringing the number of available patterns to six (Types I, II, II-4-way, III, IV, and V). The Suburbanaire is designed to fill rural and street lighting requirements; the PTL is especially suitable for lighting recreational areas and roadways. For full facts, write LINE MATERIAL INDUSTRIES, SOUTH MILWAUKEE, WIS.

(See page 60 for more Bulletins)


Couples in seconds...
stays water-tight
TYLOX Gaskets form water-tight, compression seals automatically as pipe is coupled. They keep their elasticity, and stay water-tight for the life of the pipe itself.

TYLOX Rubber PIPE GASKETS

It takes only a few seconds to couple Tylox-Gasketed sewer pipe, but even more important than that, finished joints *stay* tight, preventing leakage in or out, and making future maintenance unnecessary by eliminating root and sediment problems. The installation above was a joint project of the Virginia Polytechnic Institute and the Town of Blacksburg, Virginia, R. Stuart Royer & Associates, Consultants, Richmond, Va. Pipe work was by Gimbert and Gimbert Construction Co., Roanoke, Va., and 15" Tylox-Gasketed Pipe was furnished by Roanoke Concrete Products Co., Inc., also of Roanoke.

Pipe joints formed with Tylox rubber Gaskets stay tight because they keep their original elasticity. Under ground and under compression, sewerage and industrial waste acids won't deteriorate the specially compounded Tylox rubber, and pipe angularities from shifting soils or overburdens can't break their seal. Leakage, with resultant evils of root and sediment penetration is whipped because it *can't start!* Waste disposal designers and builders know this . . . and it is why there are more TYLOX Gaskets in low head service than all other types of gaskets combined. As for speed of assembly, there's no joint that can be coupled any faster than TYLOX.

WRITE FOR MORE TYLOX INFORMATION

if you are not thoroughly familiar with its time-saving, cost-saving engineering advantages. Tylox Joints are the one sure way to get water-tight pipe lines at less pipe-laying cost.

HAMILTON KENT
MANUFACTURING COMPANY
KENT, OHIO
427 West Grant St. ORchard 3-9555

CANADIAN PLANT: 10 Brussels St., New Toronto, Ont., CLifford 1-2494

5134

YOU NEED *These catalogs*

Write directly to the address given or use the Post Card on page 51.

Law Enforcement Equipment

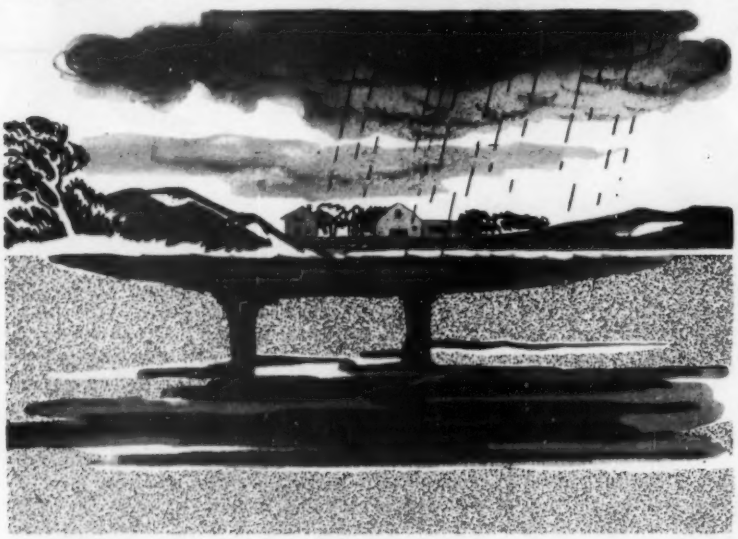
204 A spiral-bound booklet, available from FEDERAL LABORATORIES, INC., SALTSBURG, PA., contains an impressive complement of equipment for law enforcement agencies. Included are tear gas products and equipment, ammunition, firearms and accessories; fingerprint kits and accessories; emergency signal-lights, sirens, flares, megaphones, and restraint equipment.

Galion's 160 Grader

205 . . . is power balanced to weight to provide the utmost in tractive effort and front-end stability. It has a 160-hp direct-starting diesel engine, combination manual with hydraulic power steering, 4-wheel hydraulic brakes, same size tires front and rear for interchangeability. Write to THE GALION IRON WORKS & MFG. CO., GALION, OHIO.

Aluminum Lighting Standards and Davits

206 . . . for street and highway lighting are given thorough coverage in *Catalogs* ALS and BR-11, available from PFAFF & KENDALL, 84 FOUNDRY ST., NEWARK 5, N. J., leading manufacturer of functionally designed outdoor lighting equipment.



UP-SIDE-DOWN WATER WELLS

There is comfort in the knowledge that today's engineers and water works men are craftsmen thoroughly familiar with the water problem and its remedy.

Extensive experiments are being made to control drought by producing artificial rainfall. "Upside-down wells" are used in some areas with declining water tables, run-off surface water during peak rainfall being injected into the ground through wells. Waste of water through evaporation in some dry areas is as much as eight feet of water per year from reservoir surfaces. Recent experiments in spreading a thin coat of cetyl alcohol on a water reservoir surface reduced evaporation as much as 65%. Considerable progress is being made in research and experiments designed to remove salt from sea-water.

It is no longer true that "much water goeth by the mill which the miller knoweth not of." Water works men know the facts of life so far as water is concerned, but they need public support.

This series is an attempt to put into words some appreciation of the water works men of the United States.

M&H VALVE
AND FITTINGS COMPANY
ANNISTON ALABAMA

SUBSIDIARY OF W WALWORTH

Keeps Sewer Lines Free Flowing

207 Sanfax 222 is a quick-acting power-packed chemical that burns out tree roots, trash and impediments to increase sewer line efficiency. It can be used on a preventive maintenance basis and is reported to slash both labor and maintenance costs. For complete information, write THE SANFAX CO., P. O. BOX 604, ATLANTA, GA.

Plastic Pipe for Water Service Lines

208 A new catalog sheet tells why water service line installations are permanent yet economical when Republic SRK plastic pipe is used. Installation diagrams are included, showing SRK joined in combination with both curb cock and the tail piece. For a copy of *Form* No. ADV. 1098, write ADVERTISING DIV., REPUBLIC STEEL CORP., 1441 REPUBLIC BLDG., CLEVELAND 1, OHIO.

Litter Gatherer

209 The Grounds Groomer gathers litter of practically every kind—wet or dry leaves, scrap paper, sticks, stones, bottles. It is designed for use on parks, cemeteries, golf courses, parking lots: can be operated by one man at speeds up to 12 mph. Capacity of its quick-dump body is 7 cubic yards. For descriptive literature, write RONNING CORP., 949 CENTRAL AVE., N. E., MINNEAPOLIS 13, MINN.

Sanitary Refuse Collection

210 An illustrated 8-page booklet, issued by HOBBS TRAILERS, 609 NORTH MAIN, FORT WORTH, TEXAS, explains how municipal refuse collection can be put on a money-saving basis with the new Hobbs-Hydepak 60 model, a stronger, watertight collection body with low loading height. Also described is the Hydepak Container System.

Traffic and Street Name Signs

211 A full-line catalog of traffic and street name signs for towns and highways is offered by GRIMM STAMP & BADGE CO., 8105 ROSALIE, ST. LOUIS 17, MO. Included are stop signs, speed limit signs, street name signs with U. S. standard wordings. Signs are die-embossed or silk screened, plain or reflectorized, embossed aluminum or steel.

Easily, Quickly Repairs Leaks in Pipe

212 An improved Heavy Duty Patchmaster pipe repair clamp, for pipe sizes from ½" through 8" and in widths of 3", 6", 9" and 12" features a new lug design, which allows the clamp to conform to the contour of the pipe under high torque without biting into the pipe. The Buna N pad will withstand high clamping pressures without extruding, and it is adaptable for water, steam, gas and oil. For details, write ADVERTISING DEPT., AEROQUIP CORP., MARMAN DIVISION, 11214 EXPOSITION BLVD., LOS ANGELES 64, CALIF.

Removes Iron, Manganese from Water Supply

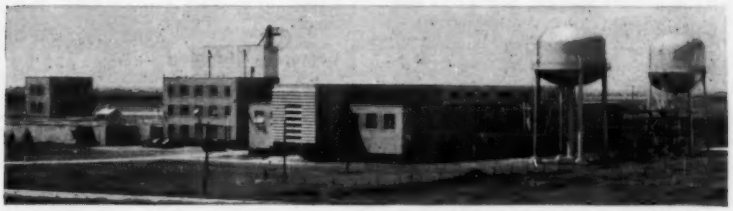
213 An 8-page bulletin describes and illustrates four basic treatment methods for the removal of iron, manganese, gas, taste and odor and for pH correction of water for municipal supply. Several filter plants are pictured and a discussion of pilot plants and their use in studying and predicting actual plant performance is included. For a copy, write GENERAL FILTER CO., AMES, IA.

(See page 62 for more Bulletins)

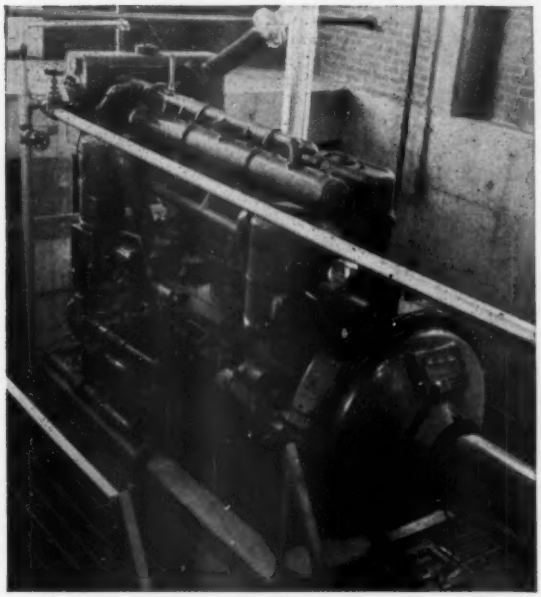
ROILINE ENGINES
(Formerly LE ROI)

* The trade mark LE ROI is used under license from Westinghouse Airbrake Co., the trade mark owner.

POWER FOR MUNICIPAL PLANTS

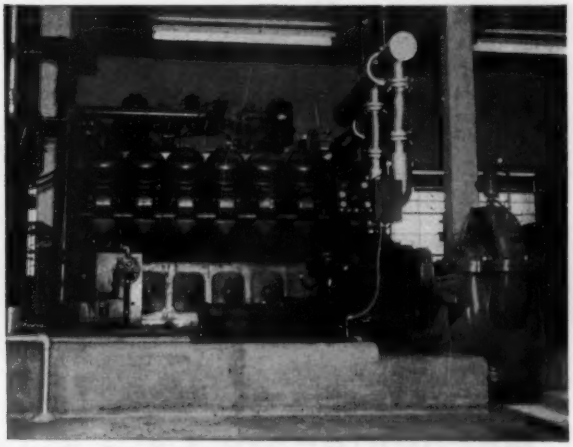


Three ROILINES pull the pumps at Oklahoma City's Lake Hefner Municipal Filtration Plant.



Model F-1500, maximum horsepower 215 at 1200 rpm on natural gas.

Model L-3460, maximum horsepower 595 at 1350 rpm on natural gas.



BASIC ENGINE CHARACTERISTICS*

GASOLINE OR NATURAL GAS					600	800	1000	1200	1400	1600	1800	2000	2200	2400
MODEL	Bore & S.	Cyls.	Displ.	Torque–rpm	BRAKE HORSEPOWER AT ENGINE SPEEDS INDICATED									
H540	4½ x 4¼	8	540	430- 900	...	64	82	99	115	130	143	155	164	170
H844	5¼ x 4⅞	8	844	637-1500	...	106	135	165	191	215	237	255	270	278
F1500	6¾ x 7	6	1503	1090- 650	125	165	200	215						
H2000	6¾ x 7	8	2004	1485- 650	170	225	270	290						
L3000	6¾ x 7	12	3006	2200- 650	250	335	405	435						
L3460	7¼ x 7	12	3468	2570- 900	285	391	492	568	595 @ 1350 RPM					
L4000	7.54 x 7.5	12	4000	2930- 900	325	446	560	645						

*With oil pump, water pump, magneto, air cleaner, carburetor, and exhaust muffler. Hp shown is maximum.

SEE YOUR ROILINE ENGINE DISTRIBUTOR

ARIZONA, Casa Grande, Engine Service Company, Inc.
ARKANSAS, Paragould, Wonder State Manufacturing Co.
CALIFORNIA, Long Beach, Engine & Equipment Company
COLORADO, Denver, Emrick & Hill Engine & Equipt. Co.
KANSAS, Garden City, Carson Machine & Supply Co.
LOUISIANA, New Orleans, Southern Engine & Pump Co.
MICHIGAN, Reed City, Hafer Engine Company
NEW YORK, Syracuse 6, J. C. Georg Corporation
OHIO, Columbus 19, Cantwell Machinery Company
OKLAHOMA, Oklahoma City 9, Carson Machine & Supply Co.
PENNSYLVANIA, Bradford, R. R. Reck Company
TEXAS, Houston 1, Southern Engine & Pump Co. (also in Beaumont, Corpus Christi, Dallas, Edinburg, Kilgore, San Antonio)
Lubbock, Farmers Supply
Odessa, General Machine & Supply, Inc.
Wichita Falls, Nortex Engine & Equipment Co.
WYOMING, Casper, Emrick & Hill Engine & Equipt. Co.

424-R-1

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. / **New York • Tulsa • Los Angeles**
Factories: Waukesha, Wisconsin and Clinton, Iowa

CATALOGS *for Improved Municipal Services*

Write directly to the address given or use the Post Card on page 51.

Conquers Rust

214 A new 4-page folder describes how the metal treatment "Ospho," when applied directly on rusted metal, stops rust action and provides a sound base for regular maintenance paint. It also explains why Ospho provides a good bond between new metal and paint. For a copy, write RUSTICIDE PRODUCTS CO., 3125 PERKINS AVE., CLEVELAND 14, OHIO.

1960 Canvas Catalog

215 . . . now available from FULTON COTTON MILLS, CANVAS DIVISION, P. O. BOX 1726, ATLANTA 1, GA., illustrates and describes strong, protective, durable Fultex, Shuredry and Fulton tarpaulins, as well as sporting and play tents. Specification tables are included to help you select the tarp that best suits your needs. Request *Catalog* 160.

Cemetery Planning

216 The subject of cemetery planning is comprehensively treated in a booklet, available from ROCK OF AGES, BARRE, VT., which includes chapters on designs for large and small sections, suggested cemetery rules and regulations, specifications for memorial work and companion garden sections.

Automatic Coin Feeder

217 The Klopphopper (Model H) handles large quantities of coin efficiently. Its self-adjusting switch control regulates flow of coins to correspond with the capacity of the operator or counting and sorting machinery (maximum delivery is 6000 coins per minute). For descriptive literature, write KLOPP ENGINEERING, INC., 35551 SCHOOLCRAFT, LIVONIA, MICH.

By-Pass Lighting

218 *Bulletin* GER-1598, a reprint of an article by Ernest F. Siegel of Green Associates, Inc., entitled "By-Pass Lighting Is Different", discusses all phases of by-pass roadway lighting including new design concept, need for lighting, approach and tunnel lighting, power distribution system, and luminaire selection. It can be obtained from GENERAL ELECTRIC CO., SCHENECTADY 5, N. Y.

Swimming Pool Paint

219 This new rubber base, nongloss coating for masonry built swimming pools, available in aqua and white and packaged in one gallon and five gallon pails ready for application, is fully described in a catalog sheet, available from AKONA CHEMICAL CORP., ANOKA, MINN. Also described is a sealer paint for first coating for pools made of open textured masonry.

New Road Leveling Implement

220 Literature announcing the 25' long C-126 DI road planer, being offered by SPEEDLINE IMPLEMENT MFG. CO., LAS CRUCES, N. M., emphasizes its constant cutting and filling action, which eliminates gouging and excess dumping and minimizes gravel segregation, and its ability to deliver long leveling accuracy comparable to machines twice its length.

Accurate Measuring Wheel

221 Just roll this sturdy, time-saving calibrated instrument along and it will quickly and surely measure to a fraction of an inch, even over irregular terrain. It is light in weight and comes equipped with automatic brake and built-in stand. For full facts on Model 415, write ROLATAPE, INC., 1741 14TH ST., SANTA MONICA, CALIF.

Steel Water Pipe Booklet

222 This 8-page brochure, issued by the STEEL PLATE FABRICATORS ASSOCIATION, 105 W. MADISON ST., CHICAGO 2, ILL., emphasizes the extreme durability and long life of steel water pipe in both text and illustration. It also lists seven essential requirements for a water pipeline.

Reflective Traffic Markings

223 *Bulletin* "SD" describes a new self-adhering traffic marker that takes no get-ready, no warm-up and is easy to apply; *Catalog* PP59, reflective spheres and binder ready-mixed for latent reflectivity; *Folder* GS58, glass spheres for reflectorizing paint; and *Bulletin* P-256, a sign finish with high refractive index that gives soft-glow legibility at both long and short distances. For copies, write, PRISMO SAFETY CORP., HUNTINGDON, PA.

Chips Brush into Chips, Reduces Haulaway Costs

224 Useless brush and branches and limbs up to 6" in diameter are quickly converted into easily transportable wood chips, that can be used for mulch, flower beds, fuel and other purposes, by the Beaver brush chipper. For descriptive literature, write MITTS & MERRILL, 1003 S. WATER ST., SAGINAW, MICH.

Revolutionary TRUCK-LODER Frees One Man For Other Sewer-Cleaning Jobs!

The Truck-Loder Bucket Machine brings the deposits direct from the sewer to truck *non-stop!*

It ends the hard dirty work of manually pulling on the bucket to dump the load; shoveling the deposit from street to truck; and cleaning up the street afterward. It's faster – easier – more sanitary. In other words, it puts an extra man in your Sewer Department at *no extra cost.*

Best of all, you can pair up Truck-Loders with present Bucket Machines and almost triple your sewer cleaning capacity.

To get the full Truck-Loder story, write for the name of your nearest "Flexible" Distributor.

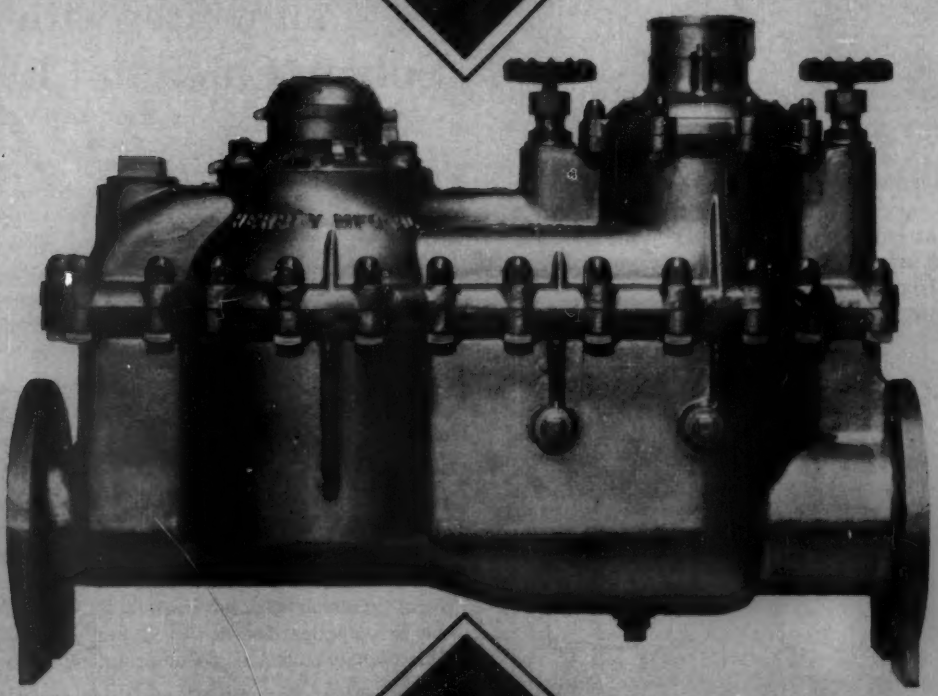
FLEXIBLE INC.

3786 DURANGO AVE., LOS ANGELES 34, CALIF.
1005 SPENCERVILLE ROAD, LIMA, OHIO
415 S. ZANGS BLVD., DALLAS, TEXAS

HERSEY COMPOUND METERS

ALL BRONZE CASE 2" to 6" INCLUSIVE

Of course they are the best!
Specified by experienced water works officials in all fifty States



HERSEY 1859 1959 100 YEARS OF PROGRESS

HERSEY MANUFACTURING COMPANY

(Established 1859)

DEDHAM, MASS.

BRANCH OFFICES: NEW YORK — PORTLAND, ORE. — PHILADELPHIA — ATLANTA
DALLAS — CHICAGO — SAN FRANCISCO — LOS ANGELES

YOU CAN'T BUY A BETTER WATER METER THAN HERSEY

For The Best Connection You'll Ever Make—

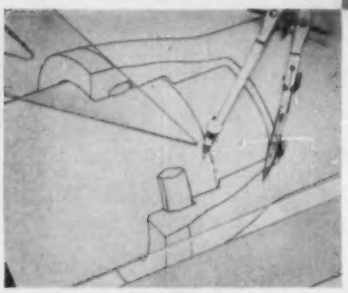
ALTITE JOINT

By APCO

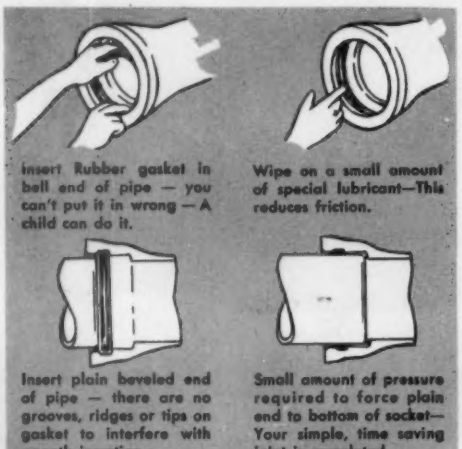
Efficient, Economical and Fool Proof—

Underwriters Approved

Patent Applied For.



The **ALTITE JOINT** has been subjected to a series of rigid tests much more severe than are encountered under the most extreme installation and service conditions in the field. Even under extreme conditions, this joint is so simple to install—you could hardly go wrong if you tried.


Insert Rubber gasket in bell end of pipe — you can't put it in wrong — A child can do it.
Wipe on a small amount of special lubricant—This reduces friction.
Insert plain beveled end of pipe — there are no grooves, ridges or tips on gasket to interfere with smooth insertion.
Small amount of pressure required to force plain end to bottom of socket— Your simple, time saving joint is completed.

For Efficiency, Economy and Simplicity—

Order ALTITE For Your Next Job

ALABAMA PIPE COMPANY

General Offices—ANNISTON, ALABAMA

SALES OFFICES

122 South Michigan Ave., Chicago 3, Ill.
350 Fifth Ave., New York 1, N. Y.
905 1006 Grand Ave., Kansas City, Mo.
18505 W. Eight Mile Rd., Detroit 41, Mich.
5335 Southern Ave., South Gate, Calif.

Keep pavements bare all winter with Solvay Calcium Chloride

—SALT MIXTURES

This winter use the method of leading turnpikes that achieve "no shut-down" records despite the severest weather. Combine Solvay® Calcium Chloride with salt. Make sure you have ample stocks on hand, at money-saving bulk rates.* It can be stored alone, or mixed with salt, outdoors under tarpaulin covers, in indoor sheds or covered bins.

Bulk handling of Solvay Calcium Chloride is a one-man operation, both in loading and application. It can be used economically by large and small highway departments.

Calcium chloride-salt mixtures are effective at all temperatures and humidities. While salt's best range is 25-32°F., calcium chloride speeds melting at all temperatures, even down to below zero . . . provides the moisture salt needs to act. Calcium chloride liberates heat as it melts ice, which helps salt work faster. When you combine the two, applications can be lighter and less frequent. This reduces chemical consumption and lowers cost.

For *instant* skidproofing of icy surfaces, treat abrasives with Solvay Calcium Chloride. They hold fast in wind and traffic at all temperatures.

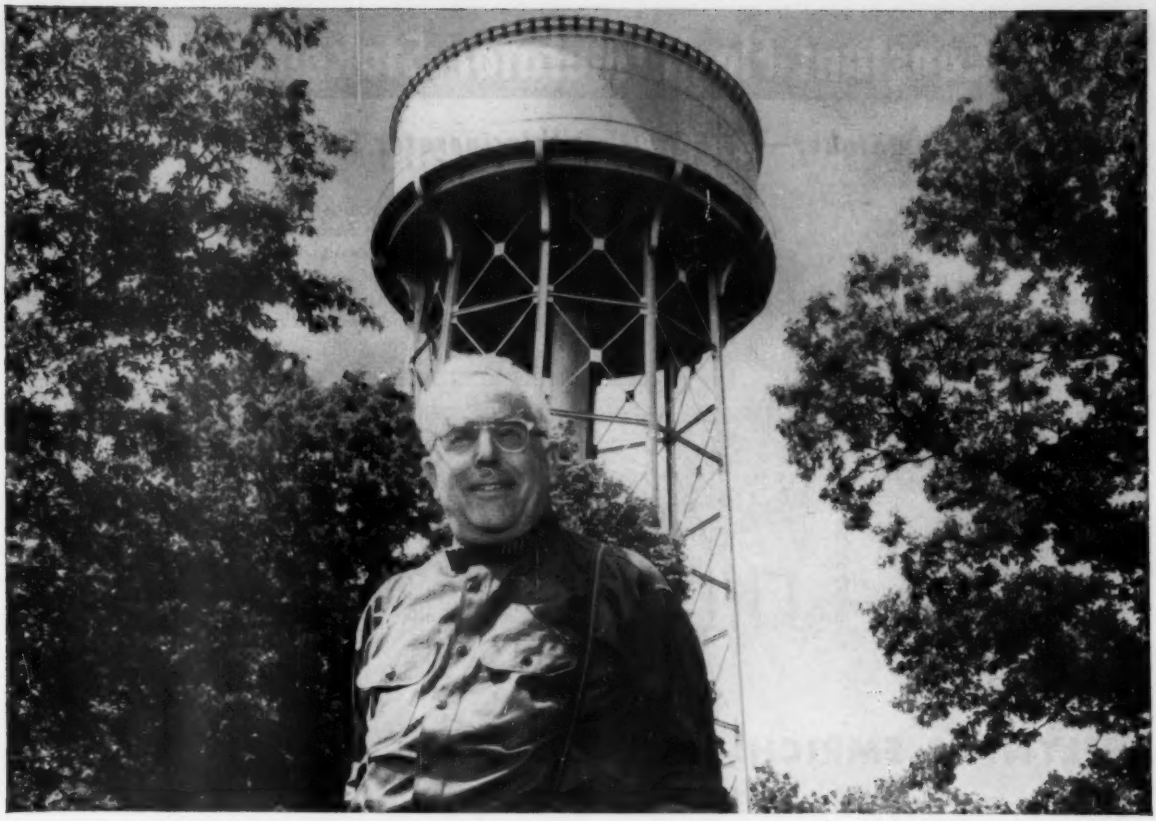
**Also available in moistureproof bags.*

Write us now. Request "ice control data." If you are interested in applying bulk handling to your set-up, ask for a Solvay representative to call. No obligation!

Allied Chemical

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N. Y.

SOLVAY branch offices and dealers are located in major centers from coast to coast.



Jim Studley, Rockland, Mass. Water Department Supt. says:

"We really got our money's worth with Koppers' long-life coatings and top-notch service"

Rockland's 500,000 gallon water storage tank is an excellent example of the versatility of Bitumastic® coatings: it uses five different Bitumastic products to meet five different protective requirements.

As Mr. Studley puts it, "It's the inside you worry about: anyone can tell how outside coatings are standing up." To protect the storage tank interior, three coats of Bitumastic Tank Solution—specially compounded for potable water tanks—were used, with special protection of the tank roof by two coats of Bitumastic No. 50. The structure's exterior was coated with Bitugloss® Aluminum Paint for beauty and protection, with catwalks getting the extra protection of Bitumastic Black Solution.

At the base of the tower, where new studs and bolts were installed, a pouring of Bitumastic Super-Service Black will prevent corrosive attack at this vital structural joint.

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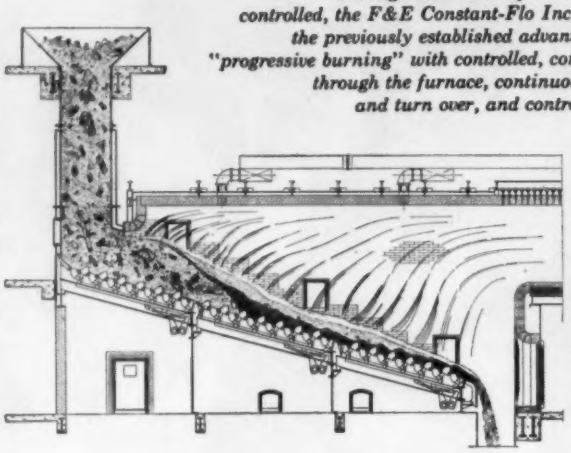

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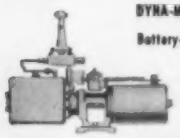

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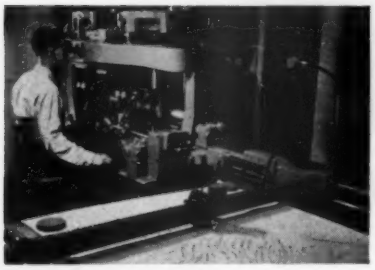

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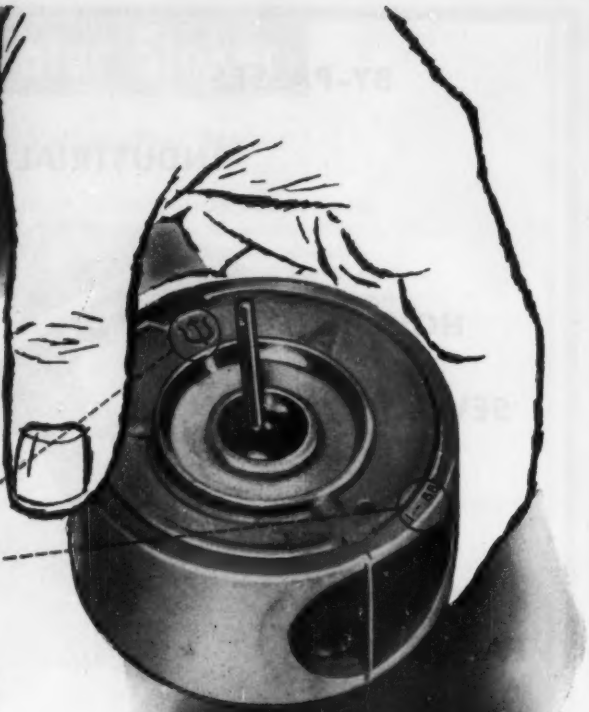

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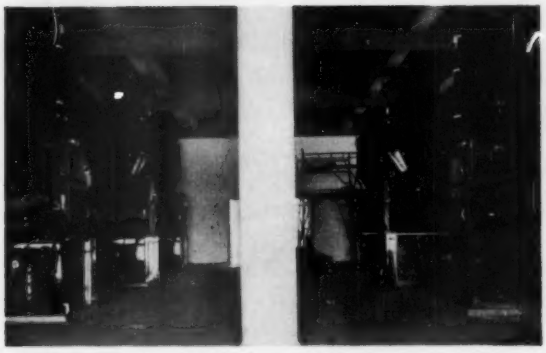
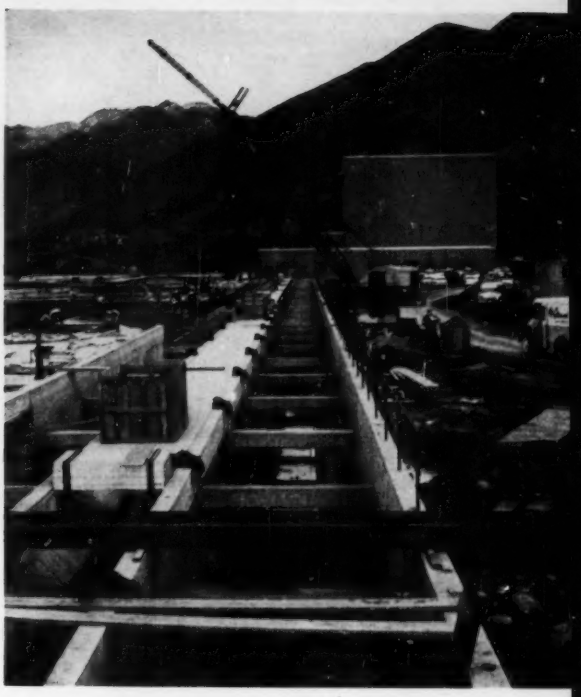


Six large gravimetric feeders will handle all dry chemicals.



Water entering the plant first flows through these twin grit and aeration chambers. The chemical building appears in the background.

Big Water Plant—Small Plant Site

The Metropolitan Water District of Salt Lake City uses modular design to save space in its big new purification plant

By W. C. HAGUE*
Chief Engineer

Next spring a $7.5-million investment will start paying dividends to residents of the Salt Lake City area. This money is being spent on the construction of a 100-mgd water-treatment plant which is scheduled for completion about April 1, 1960. Although large in capacity, the plant occupies relatively little space because of its modular construction. It includes facilities to handle a wide range of chemicals and is equipped to provide aeration, coagulation, sedimentation, filtration and disinfection.

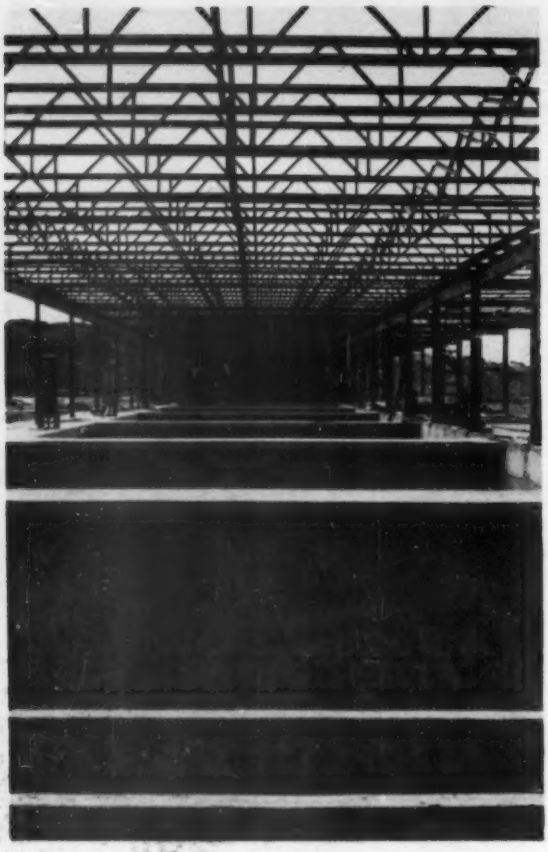
The plant is located about 15 miles from downtown Salt Lake City and is situated at a point where two raw-water supply lines almost come together, thus requiring a minimum of transmission-main construction. Flow to and through the plant is by gravity.

The ten mixing, coagulation and sedimentation basins are set in one row, with the grit collectors and aeration chambers on one end and all the filters on the other end. This makes for a simple flow diagram and also permits a maximum of capacity in a minimum of space.

John A. Carollo, consulting engineer of Phoenix, Ariz. designed the plant and is also supervising construction. Construction started on June 10, 1958.

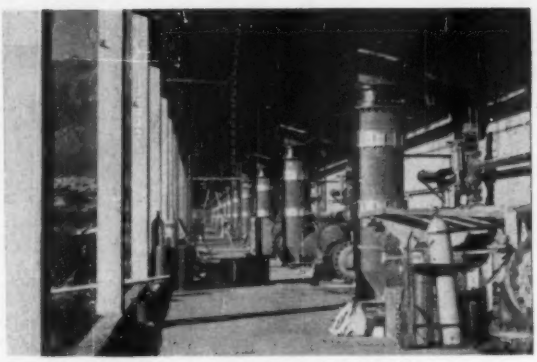
Raw water comes from two sources: the Deer Creek Supply, the major source, which flows from a large dam and storage reservoir about 55 miles southeast of the city and is delivered to the plant via

* Mr. Hague, formerly Assistant Superintendent of the Department of Water Supply, Salt Lake City, has served as Chief Engineer of the Metropolitan Water District of Salt Lake City since 1950.



Design Data of Various Treatment Units

	Detention time at 100 mgd
Aeration basins	15 minutes
Pre-mixers	15 seconds
Flash mixers	27 seconds
Coagulation basins	51 minutes
Sedimentation basins	3 hours
Sedimentation basin overflow rate	17,000 gallons per lineal foot per day
Backwash rate	Maximum 36-inch rise per minute or 37 mgd



Placing all 20 filters in one row (left) provides for a simple and roomy pipe gallery (above).

a 42-mile, 69-inch concrete aqueduct; and the Little Cottonwood Creek Supply located just above the plant. The first supply yields about 62,000 acre-feet per year while the second supply has a yield varying from 10,000 to 15,000 acre-feet per year.

To bring water to the plant we cut into our two existing raw-water transmission mains ahead of the plant—and return the finished water to the same lines below the plant for transfer to a 40-million-gallon terminal reservoir. Return to the Deer Creek aqueduct is by gravity, but pumping is required to lift the water back to the Little Cottonwood Creek pipeline. Pumping equipment consists of three Allis-Chalmers units rated at 20 mgd, 10 mgd, and 5 mgd. The two smaller pumps are also used to lift water to the filter wash water tanks on the top floor of the administration building.

Water from Little Cottonwood Creek occasionally contains debris. This water will be cleared of debris by a screen house containing two Jeffrey screens and then will mix with Deer Creek water in a junction box ahead of the grit removal and aeration channels. From this point on the flow diagram is as follows: From the aeration channels to pre-mixers, then into flash mixers, coagulation basins, sedimentation basins and on to the filters. From the filters the water returns to the transmission mains via tunnel below the filters.

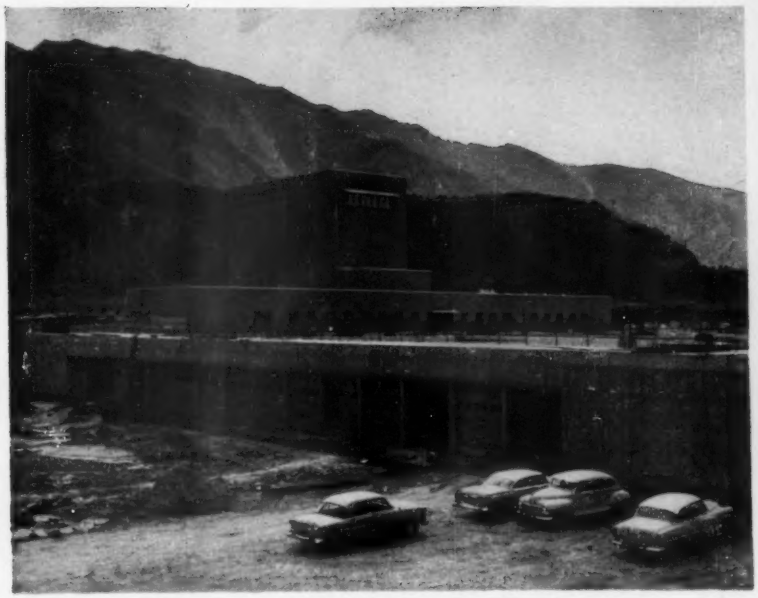
Compact Layout

The two aeration channels, located side by side, are each 13 feet wide, 487 feet long and have an average water depth of 12 feet. Link-Belt grit collectors on the forward end remove the settled grit. Aeration is provided by 22 Chicago Pump swing diffusers in each channel spaced 19.5 feet on centers, with air supplied by Roots-Connersville blowers.

Pre-mixing takes place in two tanks, while ten flash-mixing basins are available, one at the entrance end of each coagulation basin. The pre-mixers are 13 feet square and have a water depth of 12 feet; the flash-mixer basins are each 7.5 feet square by about 10 feet deep. Equipment consists of Lightnin Mixers furnished by the Mixing Equipment Company of Rochester, N. Y.

The coagulation and sedimentation basins are actually one tank, separated by brick baffle walls. The width and water depth are 78 feet and about 10 feet, respectively, with a 61-foot-long coagulation section and a 225-foot-long sedimentation section. Each coagulation basin contains six rows of paddles, with four paddles in each row. Sludge collectors in the sedimentation basins are of the standard straight-line type with cross collectors. The Equipment Engineering Company of Salt Lake City furnished the various component parts of this equipment.

The 20 filters are all in one row, butting against the effluent end of the sedimentation basins. Each unit is rated at 5 mgd at 3 gallons per square foot per minute. Equipment consists of Wheeler - type bottoms and Builders - Providence controls, meters, butterfly valves and rate-of-flow controllers. Galland-Henning Nopak hydraulic operating cylinders control the large Armco sluice gates on the filter wash-



Trucks can enter the lower level of the chemical building through this equipment garage built across one end of the plant.

This view from the chemical building shows one coagulation and sedimentation basin combination nearing completion. The administration building is in the background.

water drains. The accompanying table lists additional design data.

All operations dealing with chemicals are concentrated in the chemical building located at one corner of the facility. The basement contains eight concrete storage tanks each 20 feet square by 26 feet deep. All can be used for carbon slurry, or six for carbon and two for liquid alum. This floor also houses two Cleaver-Brooks heating boilers and pumping facilities serving the large tanks. Two electrical load centers and the dehumidification equipment occupy a half-floor just above the basement level.

The first or ground floor contains chlorine rooms, activated silica room, offices, shower and washroom facilities, blower room and the various chemical feeders. The second floor contains the bottom portions of the dry-chemical storage bins and also serves as storage space, while the third floor contains the six large steel bins used for alum, lime and ferric sulfate. The top floor houses the conveyor system.

Dry chemicals will be trucked to the plant in bulk form. A series of Fort Worth Steel and Machinery Company bucket and screw conveyors will convey the material from the receiving hopper to the individual storage tanks.

Carbon will be mixed into a slurry, pumped to tanks on the third floor and then fed to the mixing basins by gravity. Six gravimetric feeders will handle the dry chemicals, four for either alum or ferric sulfate, one for alum, ferric sulfate or lime, with one feeder for lime only.

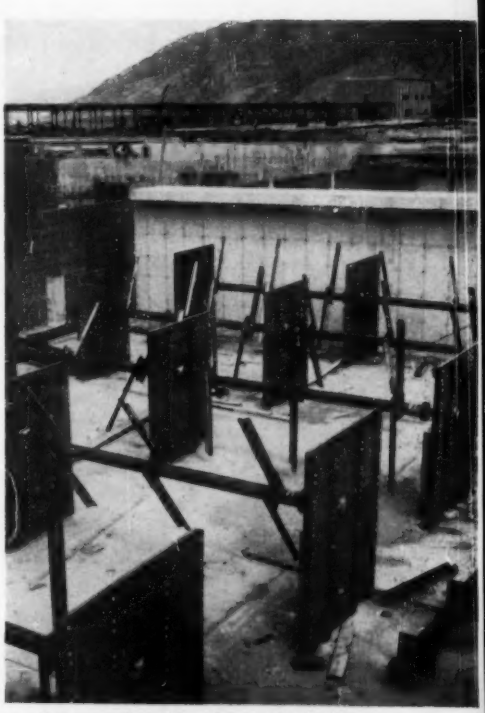
B-I-F Industries supplied the Rotodip carbon feeders, the chlorinators and pumps used in making and feeding activated silica, and the six gravimetric units.

Chlorination equipment includes two Wallace & Tiernan evaporators with one 6,000-pound-per-day and three 2,000-pound-per-day chlorinators. The three Fairbanks-Morse scales each hold two one-ton chlorine containers.

The administration building, located at one end of the filter gallery, contains four floors utilized as follows:

Ground Floor: One electric load center, air supply, filter wash water

(Continued on page 123)



A close-up showing the brick baffle wall separating the coagulation and sedimentation basins.

The insulated vertical and flat aluminum panels give a clean appearance to the large filter-dryer building. The sludge loading entrance is in the foreground.

Warren, Mich. Solves Its Sewerage Problem

. . . by constructing a sewage treatment plant with flexible sludge-disposal facilities

By **R. L. BRAITHWAITE***
Consulting Engineer

More than two hundred valves ranging from 4 to 48 inches, 84-inch sluice gates, ten 8- to 54-inch magnetic meters, 19 sewage and sludge pumps, 21,000 yards of concrete, 1,400 tons of reinforcing steel, 225 tons of structural steel, 3,000,000 pounds of cast-iron pipe—these are some of the quantities that go to make up the Warren, Mich. sewage treatment plant. Based on an estimated 1970 population of 120,000 plus industrial load, with garbage grinders in all residences, the plant is capable of producing an effluent with not more than 10 ppm of 5-day BOD and with not less than 3 ppm of dissolved oxygen.

As constructed, the plant is designed to treat an average load of 24-mgd of sewage and industrial waste with 185 ppm of 5-day BOD and 198 ppm of suspended solids.

Some combined sewage will reach the plant until a separate storm system is completed. The plant provides complete treatment, utilizing a conventional activated-sludge process as the secondary treatment. The sludge disposal system incorporates facilities to filter and flash-dry or incinerate the sludges without prior digestion. Special features include flexibility, magnetic flow meters, pressure flotation, direct pumping of sludges, nuisance control and numerous safety provisions. There are means for draining or diverting the flow from the wet well or any tank without disrupting the process. Any or all tanks or equipment can be drained and partially or completely bypassed.

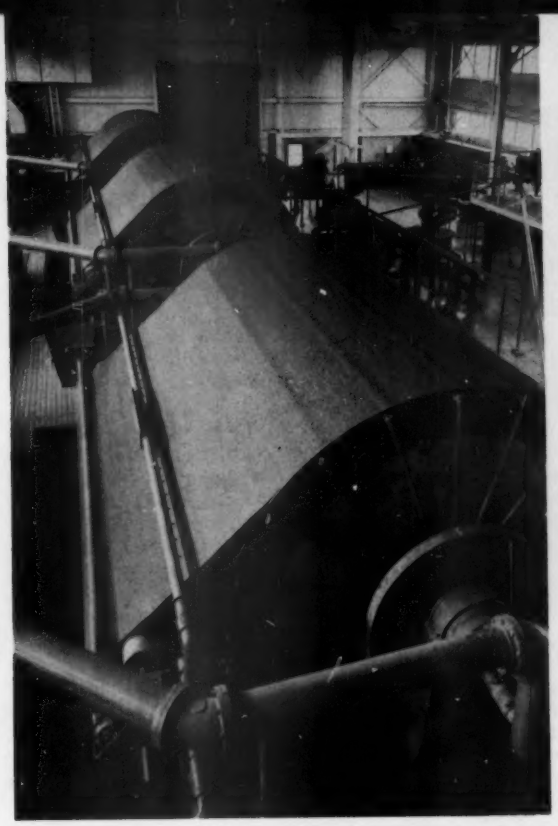
Except for initial pumping to the grit chamber, all sewage flows through the plant by gravity. A hand-cleaned course rack removes large trash and two Chicago Pump Barminutors reduce all remaining solids to ¾ inches or less in size before the sewage drops to the wet well located underneath the service-and-control building. At this point one or more of the three 24-mgd Allis-Chalmers or two 12-mgd Fairbanks-Morse raw-sewage pumps lift the sewage through either a 60-inch or 42-inch pipeline to the grit chamber.

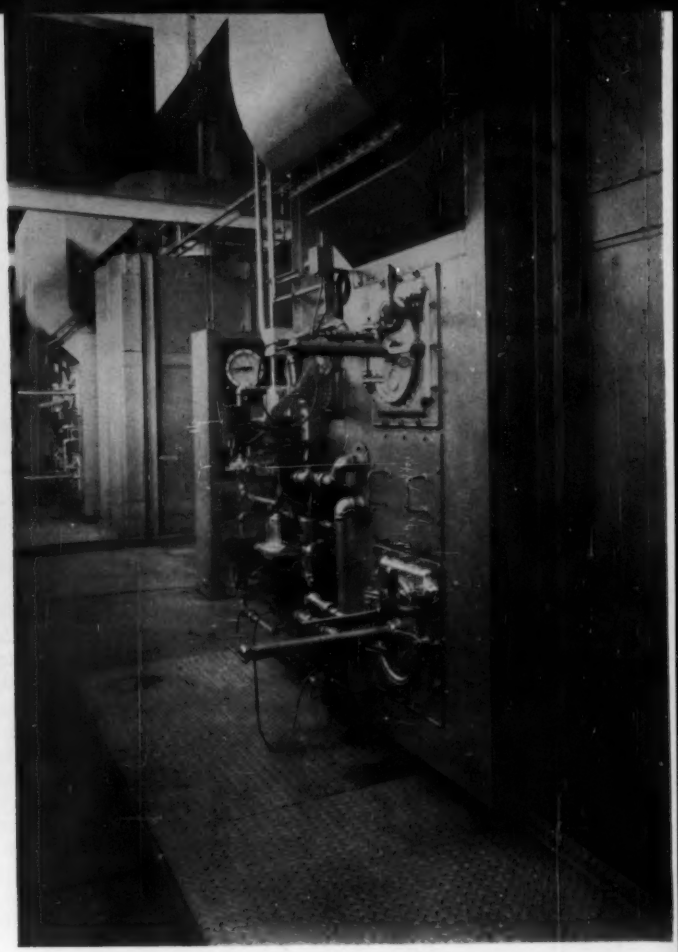
The total dynamic head is 70 feet. Allis-Chalmers cone valves on the pump discharge lines perform check and shut-off service in a manner that eliminates the possibility of water hammer.

The inorganics removed from the two grit chambers by Jeffrey rectangular collectors are washed by a water current created by adjustable baffles and removed to a storage bin.

Between the grit chamber and the primary settling tanks, the flow is measured by a 54-inch Foxboro

* Mr. Braithwaite is a sanitary engineer on the staff of Johnson & Anderson, Inc., Consulting Engineers of Pontiac, Mich.





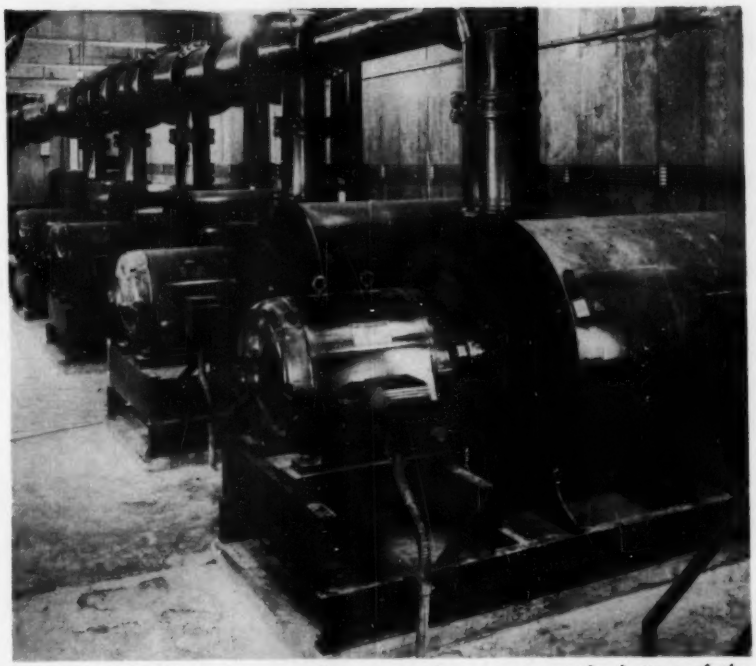
Three vacuum filter systems (above) dehydrate all sludge before it is flash-dried or incinerated in the furnaces (right).

magnetic flow meter. Just ahead of the tanks a splitting box divides the flow into equal parts between tanks in use. Submerged inlets and slotted baffles serve to reduce short circuiting.

The four primary tanks, 165 feet long, 18 feet wide and 8½ feet deep, have a relatively high surface overflow rate of 2,000 gpd per square foot. Their principal function is to remove the heavier solids and scum from the weak incoming sewage. Their capacity can be readily expanded.

The Link-Belt rectangular collectors scrape the sludge to the hoppers at the inlet end and convey the surface scum to collectors just ahead of the multiple effluent weir troughs. Helicoid cross-collectors in the hoppers convey the sludge to the suction lines leading to the Carter sludge pumps in the gallery between the tanks.

The primary effluent flows into a drop box and then into an adjacent mixing chamber where it is mixed



This bank of turbo-blowers supplies air to the spargers at the bottom of the aeration tanks. Each has a capacity of 3,000 to 6,000 cfm.

with return activated sludge. From here pipes and channels split the flow prior to its entering the four aeration tanks. These tanks are divided into three "round-the-end" baffled chambers. Each of the 12 chambers is 200 feet long, 25 feet wide and 15 feet deep. Plant effluent is pumped through sprinkler nozzles for froth control. At design flow (exclusive of return sludge) the aerators provide 6.72 hours detention.

Gallery

The gallery between the aeration tanks houses the blowers and activated sludge pumps and piping. Five Spencer Turbine low-speed turbo-blowers, each having an output ranging from 3000 to 6000 cfm, supply air to a system of Walker Process spargers. Three Fairbanks-Morse sludge-return pumps, two of 8,000 gpm capacity and one rated at 1,500 gpm, discharge return sludge into the mixing box at the primary settling tank. Two 340-gpm and one 800-gpm Yeomans pumps transfer excess sludge to the flotation units for thickening. If necessary, this sludge may be diluted with a measured amount of mixed liquor. The return and excess activated sludge and the air flows are controlled from an instrument panel located in the service building.

The aeration-tank mixture flows through another splitting box into the four final settling tanks. These 100-foot-diameter tanks, fitted with Walker Process equipment, have a surface overflow rate of 765 gpd per square foot. The activated sludge is removed from the bottom of the four tanks by direct suction of the return and excess pumps. The flow from each tank is metered and the concentration is observed in glass inspection tubes across control valves. The clarified sewage flows into an effluent weir channel and on to the chlorine contact chamber. At maximum flow, detention time in the chamber is approximately 20 minutes. Plant effluent discharges into the Red Run Drain which in turn flows into the Clinton River about four miles below the plant site.

Unthickened excess activated sludge from the aeration gallery flows to either of the two 250-square-foot F. S. Gibbs pressure flotation units. These units are located above two of the four covered sludge-storage tanks at the rear of the filter-dryer building. Two of the subsurface sludge-storage tanks hold primary sludge and two, the ones beneath the flotation units, hold the thickened excess sludge. The thickened sludge is skimmed from the flotation units and discharged into either storage tank. The clarified subnatant returns to the wet well.

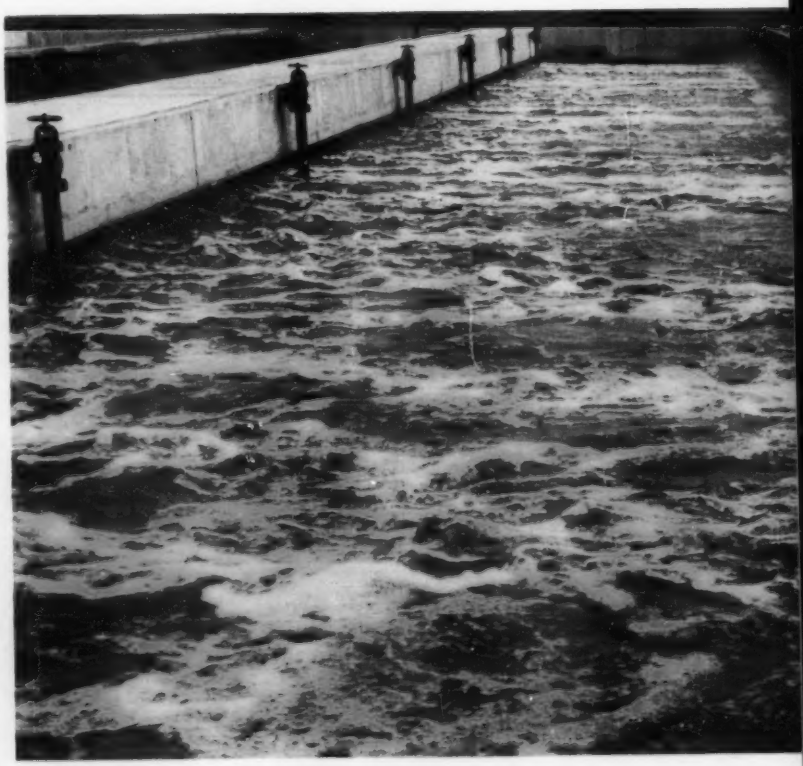
Sludge from the primary hoppers is controlled from the filter room. By observing the inspection tube on the incoming line and controlling the individual tank valves, operators permit only the thicker sludge to reach the filters. Any thin sludge appearing in the incoming line is diverted to the wet well.

All sludge is dehydrated and then either flash-dried or incinerated. Each of the three vacuum-filter systems includes an activated and a primary sludge-supply pump. The filter system consists of a rapid mixer which combines the two sludges into a homogeneous mixture, a conditioning tank, a 565-square-foot Komline-Sanderson vacuum filter, and a vacuum and a filtrate pump.

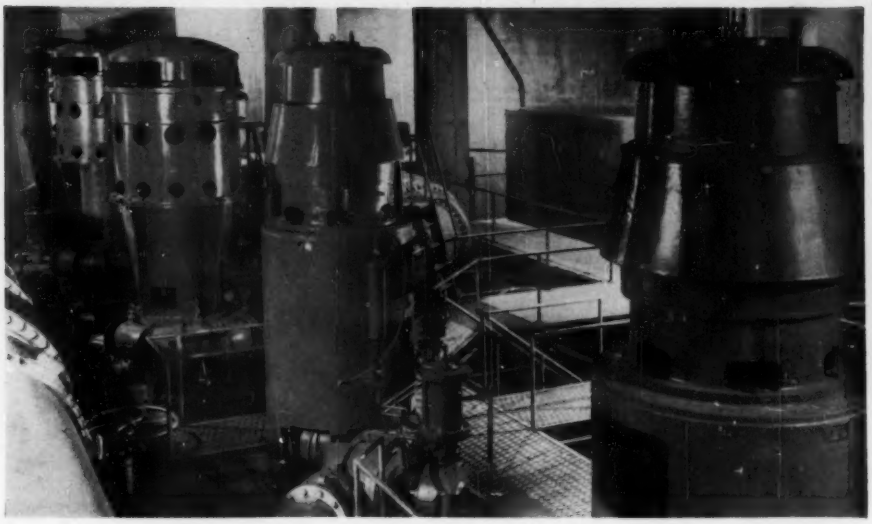
Each filter-supply pump has a sludge-inspection tube, so that if objectionable sludge is encountered at a certain level in one of the tanks, one pump can bypass to the wet well, while the others are switched to another tank. A wide range of flexibility is available in the pumping of sludge to the filter system. The activated and primary sludges can be processed separately. Prior to filtering, the sludge is conditioned with lime and ferric chloride.

The dryer-incinerator portion of the filter-dryer building contains three Combustion Engineering 12-foot-diameter cyclone flash-drying and incineration systems with equipment on four levels. Each system consists essentially of a furnace, cyclone, pneumatic conveyors, cake-conditioning equipment, and an ash-collection system.

Vapors and foul gases are deodorized at a temperature of 1200°F by means of deodorizing preheaters which are heat-recovery devices. During incineration, high-efficiency dust collectors of the multi-cyclone type manufactured by the Western Precipitation Corporation remove fly ash before discharging the gases to the 150-foot chimney. Foul air from the sludge-holding tanks can be utilized as combustion air by



Plant effluent is pumped through sprinkler nozzles placed along the aeration tanks to control frothing.

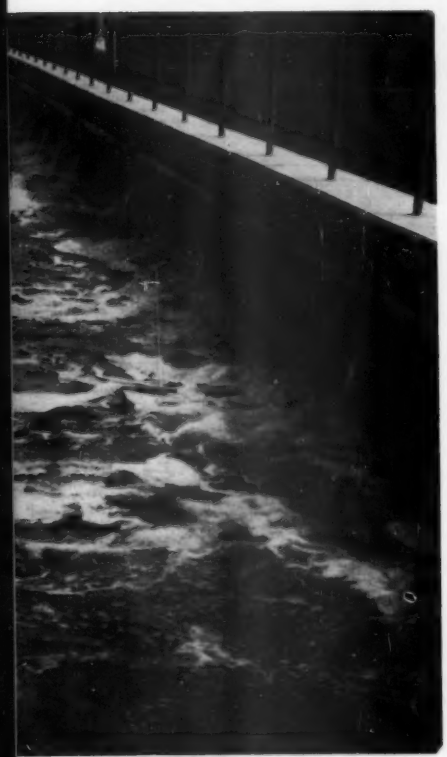


Five pumps lift all raw sewage entering the plant to the grit chamber.

the incineration equipment. Dried sludge is stored for truck removal and the ash, if the sludge is incinerated, is sluiced and pumped to an ash lagoon.

The mixed activated-primary sludge cake has a moisture content of about 75% while the dried product has a moisture content of 8% to insure a stable product which can be stored for long periods. The controls of this equipment allow sludge to be dried to any uniform predetermined moisture content continuously.

The service building functions as a control and lift station for the treatment process and as the electrical distribution center for the entire plant. It contains a well equipped laboratory and an instrumentation room. In addition to the electrical switch gear, supplied by the Square D Company, this room houses all of the important plant controls and indicators, most of which are located on the Foxboro instrument panel. Instrumentation is sufficient for the proper control of all phases of the treatment process.



Signals

Signals on the panel warn of excessive high or low levels and the presence of dangerous gases. The total operation time of all the important machinery is also indicated.

The plant draws power from two independent sources, carried by underground conduit from a substation on the site. The primary switch gear automatically switches to the alternate power source in case of failure on one service.

This structure, as well as the filter-dryer building, contains offices, shower room, lavatories, various utility rooms and extensive heating and ventilating equipment. The main floor of the service building consists of a cylinder 91 feet in inside diameter and 65 feet deep, constructed as a land caisson.

The filter-dryer building function has already been described in the sludge-handling section. The building has clean lines and a pleasing appearance achieved with R. C. Mahon insulated vertical fluted and flat aluminum panels. The lower portion of the structure is faced with brick.

The chlorine building has a storage and a machine room each with an outside entrance. Equipment includes a monorail with an electric hoist to handle ton containers, two scales each accommodating three one-ton containers, and two 4000-pound-per-day Fischer & Porter vacuum - type, solution - fed, gas chlorinators and liquid chlorine evaporators. Both pre- and post-chlorination can be employed.

The plant garage, in addition to housing vehicles, contains the overhead grit-storage hopper. Washed grit is loaded into trucks from this hopper.

Although the plant structures are located within a fenced area of only 24 acres, the entire site comprises 101 acres, thereby always insuring that there is sufficient isolation area.

The plant, constructed in 1957 and 1958 by the joint venture of Fruin-Colnon Contracting Co. and C & C Construction Co., cost approximately $6,300,000. The writer's firm designed the facility and supervised construction for the City of Warren. All work was done under the administration of the Honorable Arthur J. Miller, Mayor of Warren. The plant is under the overall direction of C. P. McGrath, Director of Public Services, with Louis D. Kifer serving as plant superintendent.

Compacting refuse to a maximum depth of 6 inches per lift, the 15-ton unit on special 14-inch tracks is riding a 40-foot-deep mass of fill.

The author stands in front of a recently completed area of Xenia's sanitary landfill.

Income Defrays Costs at "Sanitation Farm"

Xenia, Ohio is so proud of its sanitary landfill that it has filmed operations for showing to civic and professional groups in the area

By **A. M. ROBERTSON**
Sanitation Director

Xenia's refuse disposal area is located within the corporate limits of the city (population near 20,000) but it would be impossible to know that an estimated 84,000 tons of refuse have been deposited there unless someone told you what the city had been doing.

The city's self-styled "Sanitation Farm" has proved itself not only as an effective land-reclamation project—its six acres of completed fill are now in lawn, graveled drive and parking area—but as a completely self-sustaining one. The appearance that prompted one Ohio state health official to describe the landfill as the neatest he had ever seen, is an incidental dividend resulting from the program.

Xenia took over the refuse disposal operation in 1951, and made a down payment on 116 acres of farmland, a portion of which was the existing open dump. At that time, offensive odors and ever-present smoke clearly marked the disposal area.

First Steps

Next, the city bought two 12-yard Gar Wood packer bodies mounted on International L-180 chassis and a Chevrolet two-ton flat-bed truck with a seven-foot-high rack for refuse, plus a Caterpillar HT4 tractor to establish a sanitary landfill at the site of the open garbage dump.

The first operation was to rid the area of nesting rats—and there were plenty of them. It took three days and plenty of Warfarin rat poison but by the end of the third day there were nearly a million dead rats in the dump.

Xenia is currently using the area method of sanitary landfill. Refuse is collected in four white Ford-mounted Leach packers of 13-yard capacity and dumped into a worked-out gravel pit 40 feet deep. A new Cat Traxcavator spreads and compacts the refuse to a depth of between four and six inches before covering compacted material with a six-inch layer of soil dug from the sidewalls of the gravel pit. Final topping is about 18 inches of cover. About ¾ of an acre of land is filled annually to a depth of 40 feet and planted with grass.

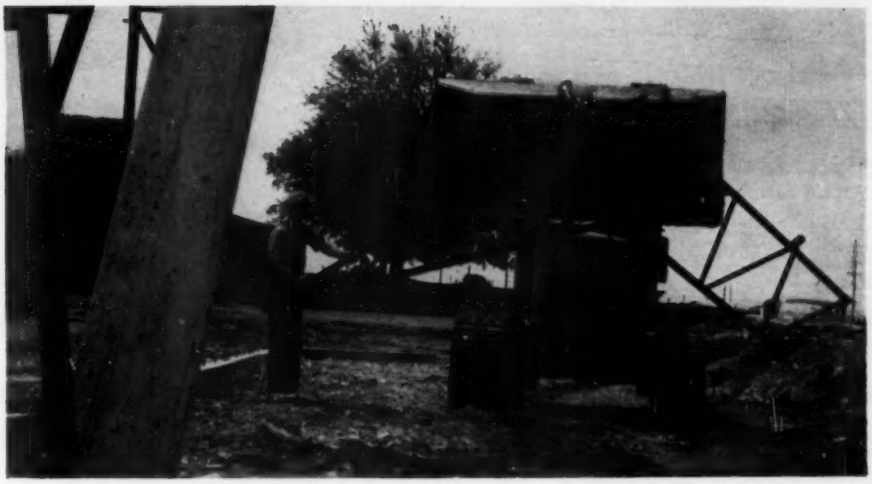
Operating Methods

A small portion of the gravel pit is maintained for working and the proceeds are used to help pay off the mortgage on the land.

The gravel pit, however, will soon be filled, and the city will alter its operation to a trench method, using the first cut to cover the last layer of refuse in the pit.

The Traxcavator performs three

Cover material is dug from the clay walls of a worked-out gravel pit. The final topping is 18 inches of this material.



The unit is pressed into odd-job service between chores at the fill. Here it lifts and places framing sections for a new machine-storage building at the site.

landfill functions. Its 2¼-yard bucket is used as a dozer for spreading refuse after it is dumped from the packers. It scoops out and carries heaped loads of clay from the pit, distributing it over the refuse. And finally, equipped with special 14-inch tracks instead of the usual 18-inch ones, the machine's 31,795-pound weight provides effective compaction in few passes. No settlement has been noted in completed areas.

The machine places, compacts and covers approximately 40 tons per day in about four hours and it performs other duties during the intervals when it is not used for this work.

It is used to erect steel framework for a new 60x112-ft. machine-storage building, lifting and placing 800-pound rigid steel frames and girders. Sanitation farm personnel chain the steel members to the bucket, and its 14-foot reach hoists them into place. On occasions when the 14-foot bucket height is insufficient, the operator builds an earth ramp to accomplish the lift.

Rags, brush and other combustible trash—not permitted in the landfill—are burned, and the unit buries the ash. Other spare-time chores include contour work and opening a new gravel pit found on the property.

The Traxcavator has logged more than 2,000 hours of operation, and records show that in those hours diesel fuel and lubricating oil cost $826.45. Repairs amounted to $75.

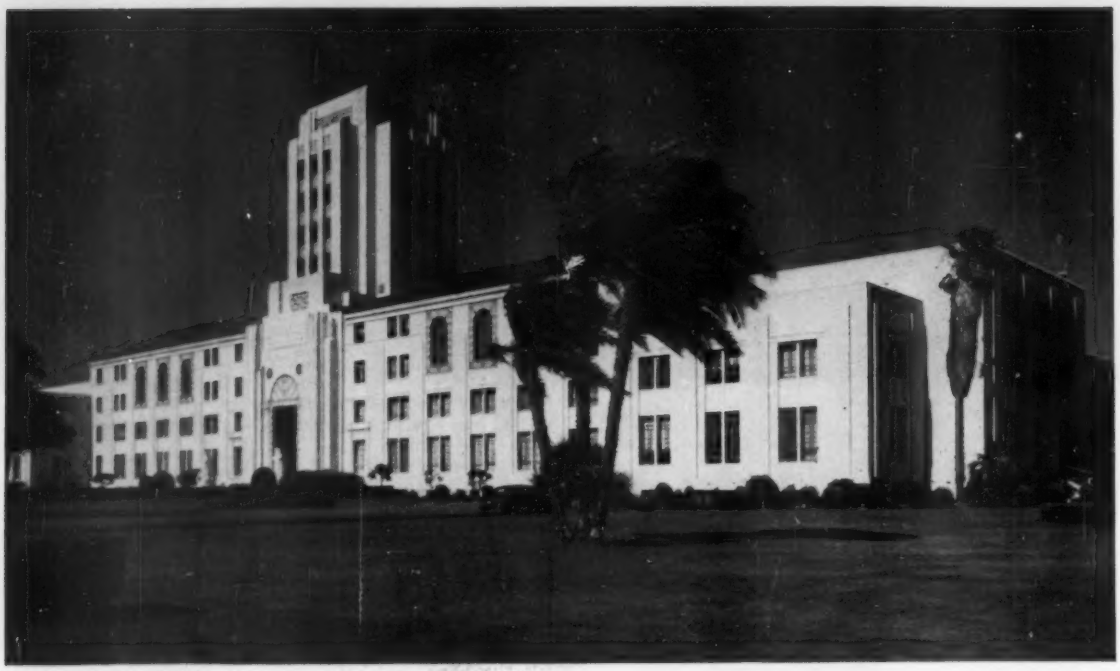
Sources of Income

The city's trucks travel four routes per day, averaging 20 miles per route. They make 6,200 residential and 600 commercial pickups in every 5½-day week. Residences receive weekly pickups; commercial establishments are served daily. Residential rates are $4.55 per quarter, while commercial rates vary according to amounts collected. Private dumpers pay a minimum charge of 35 cents. The total income defrays operating costs.

The Farmhouse

The sanitation department headquarters is a 20x30-foot white frame structure at the landfill site. It contains the director's office, the superintendent's office, lockers and lavatory facilities for the 17-man crew.

To help tell the story of the city's landfill operation to local civic and professional groups, we have filmed it. The movie is in color and runs for 17 minutes, during which one complete cycle of operation is shown. Also portrayed are finished areas, with their lawns, driveway and parking area, as well as the neat sanitation farm building. The response to this film has been gratifying.



The city-county building.

Winning Back 9,000 Square Feet and Emptying 6,000 File Drawers

By **THEODORE S. REED***
Chief of Records

Our microfilming units are set to 10,000, 12,000 or 14,000 shots per day, equivalent to 2½ file drawers, and maintain records sequence throughout the filming process.

An excellent handbook, "How to Index Your Microfilm Records." published by Recordak Corporation, can help in setting up new microfilm installations.

We get accuracy with high production by means of a unique log record and reporting system. The operator logs each flash (the large number, letter, or title sub-index) that is inserted every 500 shots as well as the first record that follows it, the meter reading and her initials. Pertinent explanations, such as any document found missing from the file, are also noted. The reverse side has space for further remarks if needed, and for recording the number of the drawer in which the film is filed. Incorporated into a log book, these sheets comprise a permanent record of all microfilming work. When adopted they increased our production 20% and reduced errors to virtually zero!

File cards record the work done for each department to date, both by reel number and by record series. Hence, any clerk needing information on one of the 30,000,000 records or 10,000 film reels can obtain it almost at once. We try to avoid the necessity for cross-indexing and label each file box so clearly that even a new employee can determine which roll is required.

Often, departments that were initially hesitant about microfilming have allowed us to film their essential records for disaster protection. Before long, they began coming to us with ideas for microfilming records on a more current basis.

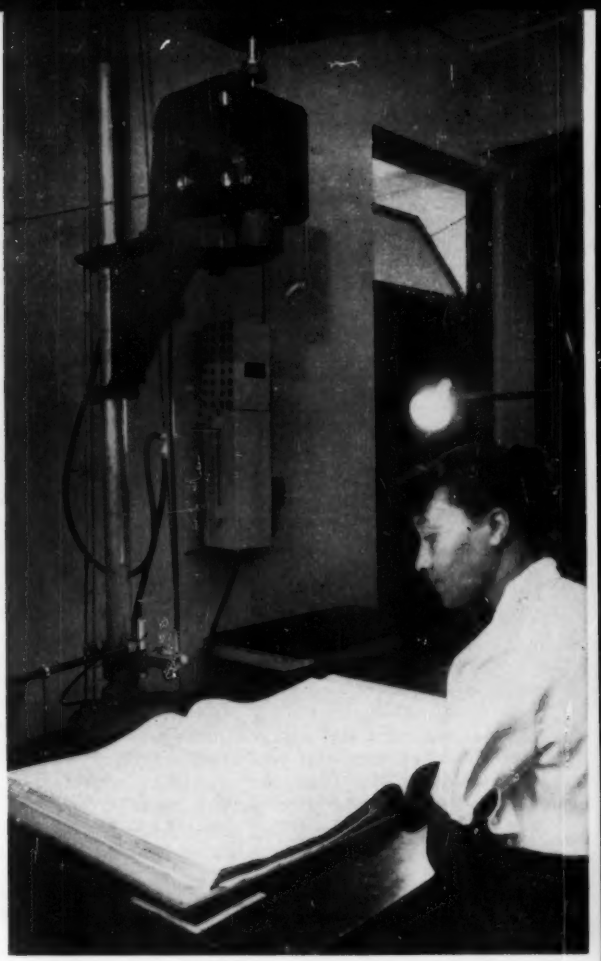
We have microfilmed approximately 12,000 cubic feet of records, occupying 9,000 square feet of floor area and 6,000 file drawers or their equivalent in other types of storage equipment. Microfilming is saving San Diego County about three times its cost each year.

When records are recorded *directly* on to film, as are the County Clerk's minutes, judgments, decrees, and orders, tremendous savings result from eliminating transcribing, proof-reading, and bookbinding. We estimate our savings at ten times the cost.

The County Recorder's official records are filmed in duplicate. One roll goes to the back-country vault for disaster protection. The other goes to the County Assessor. His engineers formerly went down two flights of stairs to the Recorder's office to dig out the records of land transfers, or, perhaps, to copy out legal descriptions by hand. Now they have built up their own microfilm file which will grow more valuable every year. We estimate that

* Mr. Reed is the Chief of the Central Records Service of San Diego County, San Diego, Calif.

Author in remote vault containing engineers' maps and minutes of the Board of Supervisors.



With a 35mm Recordak MRC, Marian Byrd copies a double-page spread of an assessment roll without unbinding it.

microfilming is now saving that office the salary of one engineer.

Additional savings accrue to the Assessor's office through the electrostatic reproduction of engineers' maps. There exists a backlog of four years of map work and similar large scale reproductions. To give us the photographic and resolving precision necessary for accurate reproduction of engineering and map drawings, we have installed a new Recordak MRC-3.

The use of unitized microfilm, mounting the images in aperture cards, has solved a problem with engineering drawings and maps. Now, as corrections in these documents are made, replacing a single card with the corrected drawing brings the entire file up to date again. The unit record idea is coming to the fore. Of course, everything is not unitized but where it can be used unitized microfilm provides all the benefits and savings of regular microfilming plus quick accessibility and interfiling.

Maxine Hoffman uses one of 33 locked drawers which hold the equivalent of 2,000 standard legal file drawers.

Margaret Burton makes use of a reader; the public as well as county personnel has access to this instrument.

The Snowfall Probability Factor

How to use it to reduce snow and ice removal costs

By J. C. THOMPSON*
U. S. Weather Bureau

Every year municipal governments in the "snow belt" must make plans to keep their vital traffic arteries open and functioning despite snowfall and ice storms. This requires certain preliminary decisions concerning the mobilization of men, machines and material — decisions which often must be based largely on a forecast of expected weather. Unfortunately meteorological science cannot yet provide perfect weather forecasts; indeed this goal is not likely to be attained in the foreseeable future. Consequently cities occasionally spend money to mobilize men and equipment only to have the predicted snowstorm bypass them. And in contrast communities may be lulled into a false security by favorable forecasts only to be crippled by a storm.

This discussion offers a city the means of balancing the probabilities of a storm against cost factors. It opens a way for providing optimum protection for the dollar spent.

Municipal Snow Problem

Suppose we consider the problem facing the city engineer of X-town He generally starts snow removal plans when he receives a warning of impending snowfall from the local weather office. His preliminary measures are carefully planned and well organized. Crews will load municipal trucks with sand and salt and will spread this mixture over the main arteries as the snow begins to fall. Other crews will be mobilized to operate snow plows, while the traffic control division will place extra officers on duty to help in the routing of rush hour traffic.

This, of course, is costly. The city engineer's job is to keep these expenses as low as possible and at the same time make certain that snow is removed efficiently from the city's streets. The meteorologist's job is to provide weather information to be used in making decisions. By working together with the engineer, it is possible to analyze both the operational risks and the forecast uncertainty to make the most economical and efficient decision.

Let us first ask the city engineer to conduct a simple operational analysis of his municipal snow problem. This would involve:

- **listing the courses of action which should be taken under various snowfall conditions**
- **estimating the cost of taking such action**
- **estimating the nature of the economic and other losses which would be expected if protective measures were not taken.**

Fortunately, most city engineers already have this information. For X-town, mobilization procedures might follow this schedule:

Mobilization Procedures

Weather Forecast	*Course of Action*
Snow or ice predicted, temperature dropping	Sanding crews alerted; extra traffic officers mobilized
Snowfall 1 to 3 inches or ice forming	Sanding crews dispatched; plows mounted on city trucks
Snowfall 4 to 8 inches	City trucks and plows dispatched; contract plows alerted
Snowfall 9 to 12 inches	Contract plows dispatched
Snowfall exceeding 12 inches	Impossible to keep all streets open; only emergency routes plowed

Next, one must estimate the cost of carrying out each action. Here again, most cities have such information. For X-town, suppose that the mobilization of sanding crews and additional traffic officers on a single occasion would cost about $500. This amount would be spent for wages, for sand and other materials to be dispersed in trucks to strategic locations and for maintenance of equipment and other overhead costs. If municipal snowplows were called out, let us assume that the initial cost of such action would be about $1,000, while if contract snowplows were required, an added cost of $500 would be incurred. The need to use emergency plow routes would not add to the snowplow expense but would require a modified course of action and result in different economic losses, so this should be listed as a separate decision item.

This information is summarized in Table I. (The reason for the redundancy in the table will become apparent later.)

The city engineer now must provide some estimate of the economic and other losses his city will suffer if insufficient protective action is taken. This may be a difficult problem. While it is usually possible to obtain some figures on the dollar losses due to an increase in the damage caused by traffic accidents, it is not easy to evaluate such intangibles as public irritation associated with increased traffic delays. Moreover, losses are often expressed in different units. Thus damage due to traffic accidents may be expressed in dollars, injuries as types of injury and number of persons, and public reaction perhaps as numbers and kinds of criticism received.

Nevertheless, these intangibles must be evaluated and expressed in common units. This requires a combination of experience, judgment, and objective analysis. A study of these factors probably would necessitate the assistance of the mayor and council, chamber of commerce, labor unions and various other interested local groups. For X-town, such a study might produce the figures shown in Table II, expressed in dollar units.

From the first column of Table II it will be noted that if no snow oc-

* Mr. Thompson is connected with the Office of Meteorological Research of the U. S. Weather Bureau in Washington, D. C.

Will abrasives be enough? (left) Or will plows be needed (right) to cope with the storm? Quantitative probability forecasts will help the man responsible for snow removal to make the right decision.

curs, no economic or other losses are shown regardless of the action taken. While lack of snow would undoubtedly be attended by traffic accidents and other difficulties, these are related to the general traffic problem and therefore should not be considered in making snow protection decisions. In other columns it is assumed that there would be no losses when the appropriate course of action is taken, but that inappropriate decisions would result in deficiencies as symbolized by the values given. Note, for example, that with 1 to 3 inches of snow, the use of snowplows would be less effective than would the appropriate decision to apply sand to the streets.

On the other hand, while the use of municipal snowplows would be fully adequate to take care of 4 to 8 inches of snow, the additional contract snowplows would be equally effective. The penalty for an improper decision of this kind would arise from the increased cost of hiring such added equipment. An unwarranted decision to use only the emergency snow routes would produce penalties in all snowfall columns except the last, where this would be the appropriate decision.

Decision Factors

With the information made available in Tables I and II, the values in corresponding boxes in both tables are now added, producing the

Table I

Cost in hundreds of dollars for preliminary measures for various predicted depths of snowfall:

	Snowfall (inches)				
Course of Action	0	1-3	4-8	9-12	Over 12
No action	0	0	0	0	0
Sanding crews & additional officers	5	5	5	5	5
Municipal snowplows	10	10	10	10	10
Additional contract snowplows	15	15	15	15	15
Emergency plow routes	15	15	15	15	15

Table II

Loss in hundreds of dollars when certain courses of action are taken and various depths of snowfall occur:

	Snowfall (inches)				
Course of Action	0	1-3	4-8	9-12	Over 12
No action	0	20	100	500	1,000
Sanding crews & additional officers	0	0	80	400	800
Municipal snowplows	0	5	0	300	600
Additional contract snowplows	0	5	0	0	400
Emergency snow routes	0	5	50	100	0

Table III

Cost plus loss in hundreds of dollars for various courses of action and snowfall amounts:

	Snowfall (inches)				
Course of Action	0	1-3	4-8	9-12	Over 12
No action	0	20	100	500	1,000
Sanding crews & additional officers	5	5	85	405	805
Municipal snowplows	10	15	10	310	610
Additional contract snowplows	15	20	15	15	415
Emergency plow routes	15	20	65	115	15

Sending out unneeded equipment can result in fruitless expenditure but being caught short in a heavy storm can also mean waste.

decision factors shown in Table III.

Now, if perfect forecasts were possible, i.e., if each of the snowfall categories were always correctly predicted, the optimum decision could easily be reached by choosing the course of action given by the minimum value in each column. However, the inherent uncertainty in weather forecasting makes this impossible. Accordingly we make use of the language of mathematical expectancy—probability. For practical purposes, the probability of an operationally critical weather event may be defined as the percentage frequency of its occurrence. With this definition, the meteorologist can provide probability predictions* which, when used with the decision factors of Table III, will produce useful operating decisions.

The Weather Forecast

A number of studies have already been made by meteorologists which show that such probability information can be usefully supplied, either by a subjective evaluation of the daily weather charts prepared at the forecast office, or by the development of objective prediction techniques. In either case, the forecasts may be presented in terms of the probability that snowfall of certain critical amounts will occur during the next twenty-four hours. The selection of these critical amounts can be based on the operational needs of the city engineer, as already outlined. A sample forecast might then look like this:

Table IV

Example of probability snowfall forecast:

Snowfall Amount	Probability
None	P_0 = 10%
1-3 inches	P_{1-3} = 30%
4-8 inches	P_{4-8} = 40%
9-12 inches	P_{9-12} = 20%
Over 12 inches	$P_{>12}$ = 0%

Thus, instead of categorically predicting that, say, four to eight inches of snow would fall during the next twenty-four hours, the forecast would say that the probability of no snow (P_0) was 10%, the probability of one to three inches (P_{1-3}) was 30%, etc., with the total percentage adding up to unity.

Optimum Decision Computation

By multiplying each of the probability values of Table IV by the corresponding expense figures in the columns of Table III, and adding these results horizontally along each row, the relative cost of carrying out the alternative courses of action can be obtained. The least expensive action will then be given by the smallest value computed by this process. An example of such a computation is shown in Table V.

From this table, one can conclude that the optimum decision—that is, the course of action which, in the long run, would provide for the least total expense—should be to obtain "Additional Contract Snowplows." Note that the cost of this action, 16.5 (hundreds of dollars), is less than any of the other values in the relative expense column.

It is interesting to note that this conclusion would not be obvious from either the operational analysis or the probability forecast considered alone. It will be observed further that the optimum decision would be to take protective action not against the snowfall amount most likely to occur but against an amount which had only a 20% chance of being observed. In fact, a decision based on the amount most likely to occur (use municipal snowplows) would be (71.5÷16.5= 4.3) over four times more expensive than the optimum action. This illustrates not only the importance of taking into consideration both the meterological and operational characteristics in making weather-dependent decisions but also the danger in using categorical weather predictions which have not been designed for the particular type of risks involved in the operation.

Discussion

The foregoing narrative is presented as an example of the manner in which the methods of operations analysis and decision theory might be helpful in resolving a municipal weather problem. Obviously the example itself is an oversimplification. Some of the complicating factors, such as the difficulty in evaluating intangible operating criteria, were pointed out in the example. Others might include changing economic factors involved in setting up

* Editor's Note: The Weather Bureau is conducting a research program for the purpose of developing techniques which provide quantitative probability estimates for the more important kinds of weather. Such techniques have been developed for use in some cities while studies are still being conducted in others.

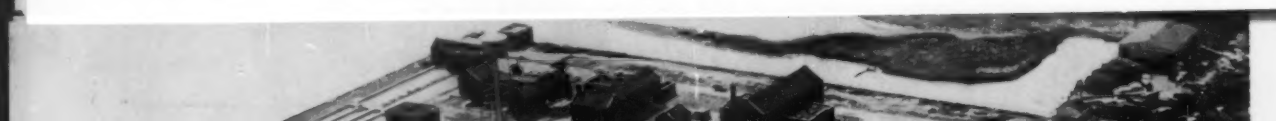


Table V

Example of optimum decision calculation. Probability values from Table IV, shown as column headings, are multiplied by expense figures in corresponding columns of Table III. The sum of these products is the relative expense of carrying out the alternative courses of action.

Course of Action	Probability P_0=10%	P_{1-2}=30%	P_{3-5}=40%	P_{6-12}=20%	$P_{>12}$=0%	Relative Expense
No action	.1x0	+ .3x20	+ .4x100	+ .2x500	+ 0x1000	= 146.0
Sanding crews and officers	.1x5	+ .3x5	+ .4x85	+ .2x405	+ 0x805	= 117.0
Municipal snowplows	.1x10	+ .3x15	+ .4x10	+ .2x310	+ 0x610	= 71.5
Additional contract snowplows	.1x15	+ .3x20	+ .4x15	+ .2x15	+ 0x415	= 16.5
Emergency plow routes	.1x15	+ .3x20	+ .4x65	+ .2x115	+ 0x15	= 56.5

the operational decision criteria and the necessity for applying a certain amount of subjective judgment in taking account of pertinent items which, for one reason or another, could not be included in the initial analysis.

Operations research of this sort provides a systematic method for organizing hard-won experience into a useful aid for making decisions. This suggests that, in many cases, the final decision may very well be identical with that which is arrived at by an experienced executive. Indeed, this would be a valuable corroboration of the validity of the decision itself. However, most problems of this kind tend to become so complex and to involve so many inter-related factors, that the human mind finds it impossible to take account of them all in any logical fashion. By organizing these variables into a systematic framework, the construction of which provides the proper solution to the problem, the accumulation of basic experience can be utilized most effectively.

Recognition of the value of such analyses is growing steadily in all phases of modern industry. No longer can decisions involving a large industrial organization be made by liberal use of executive intuition—the complexities involved are too great. In the same way, the value of systematic decision-making methods in governmental actions involving the weather are becoming apparent. The responsibility is a joint one, requiring not only understanding of the operational problem on the part of the meterologist, but also an appreciation of the uncertainties attending weather predictions on the part of the municipal executive. With this mutual understanding as a basis, the development of systematic decision-making procedures can provide appreciable gains in improved public service.

The author wishes to acknowledge helpful suggestions received during the preparation of this article from Mr. Reinhardt Schmidt, Meterologist - in - Charge, Weather Bureau Forecast Center, Washington, D. C., and Mr. William F. Roeder, Division of Sanitation, District of Columbia.

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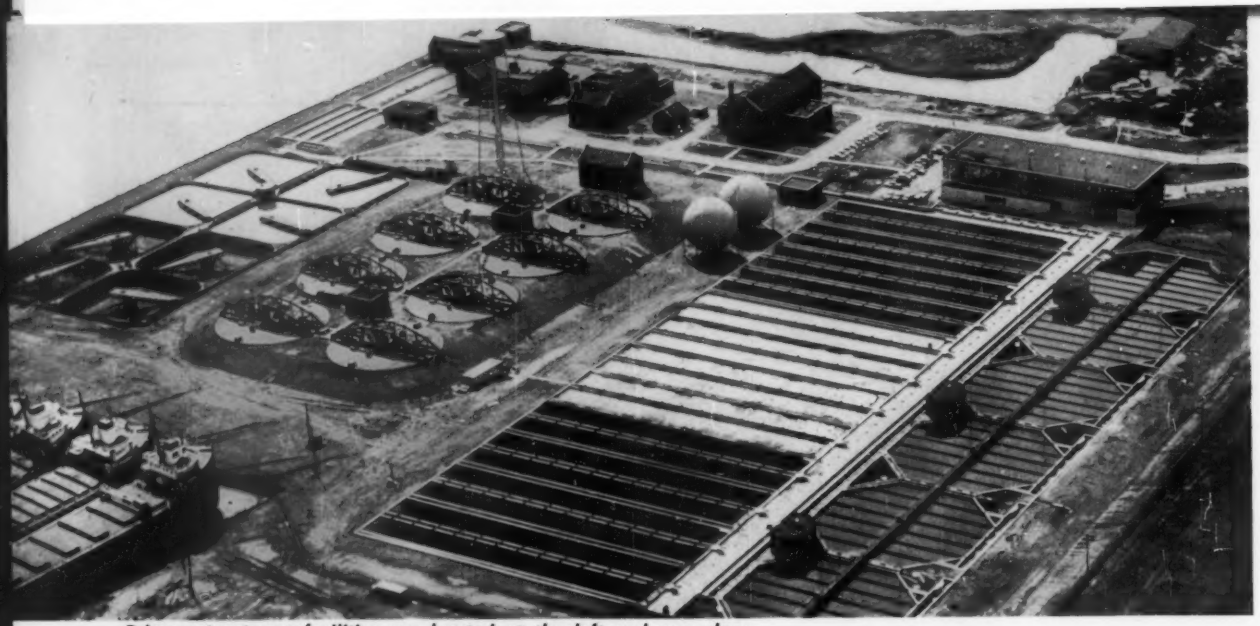
Purification Plant for Columbia, Tennessee

More than 11,000 cubic yards of clay and rock are on the move to make room for buildings, settling tanks, digesters, trickling filters and other parts of the new sewage purification plant in Columbia, Tenn. To help reduce costs, the city is using its ⅜-yard self-propelled Lorain dragline to prepare the site. The dragline scoops out earth at the rate of 200 to 300 cubic yards every nine-hour day.

being conducted in others.



Primary treatment facilities are located at the left and secondary facilities are at the right in this 50-mgd Toledo plant.

Toledo Keeps $9,500,000 Promise

Ohio city's new secondary-treatment facilities achieve 85% removals—and write the final chapter in a city-state pact to clean up the Maumee River

By **ELMER POLLEX**, Superintendent of Sewage Treatment

New and unusual secondary-treatment facilities at Toledo, Ohio, mean more than removal of 85% of pollutional wastes from the city's 50 mgd of sewage—they are the end result of a city-state agreement aimed at cleaning up the Maumee River.

Until the $9,500,000 modification to provide secondary treatment was placed into operation this year, Toledo was removing only about 25% of the pollutional material from its collected wastes. The rest was discharged into the Maumee, earning for the Ohio city the doubtful title of "one of the largest contributors—its population is about 350,000—of pollution to the river and to the Bay Area."

Constructed under supervision of Arthur H. Niles, Commissioner of Sewage Disposal, the treatment plant now provides high-rate pre-aeration, pre-chlorination, grit removal and nitrification, as well as aeration of primary effluents and final settling. In times of stress, the plant will provide primary treatment for as much as 170 mgd, bypassing secondary treatment, except for final chlorination.

Historically, the Toledo sewage treatment story follows closely those of other cities across the country. In 1922, with its population approaching a quarter-million people, raw sewage was discharged through a pumping station directly into the river. It was not until 1932 that the primary treatment plant was built. This plant provided an average of 45% removal, fulfilling requirements of the day.

However, over the years increasing flows and plant loadings resulted in lowered plant efficiency and forced the city to plan extensions to its overall treatment capacity. The Ohio Pollution Control Board "went on record," ordering Toledo to clean up the effluent of the plant, and allowed several extensions for time consumed by design and construction of the secondary facilities when it became apparent that the city was actively working toward an end of pollution in the Maumee.

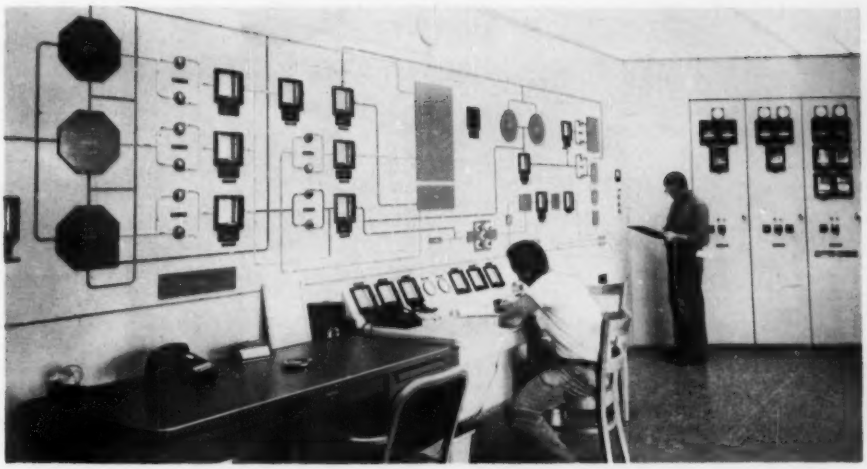
Designed for Future

The extended plant is a modified activated sludge facility that was designed by Consoer, Townsend & Associates, engineers of Chicago, Illinois, who also supervised its construction. Its present flows average about 50,000,000 gallons per day, but the plant is designed for secondary treatment of up to 70,000,000 gallons.

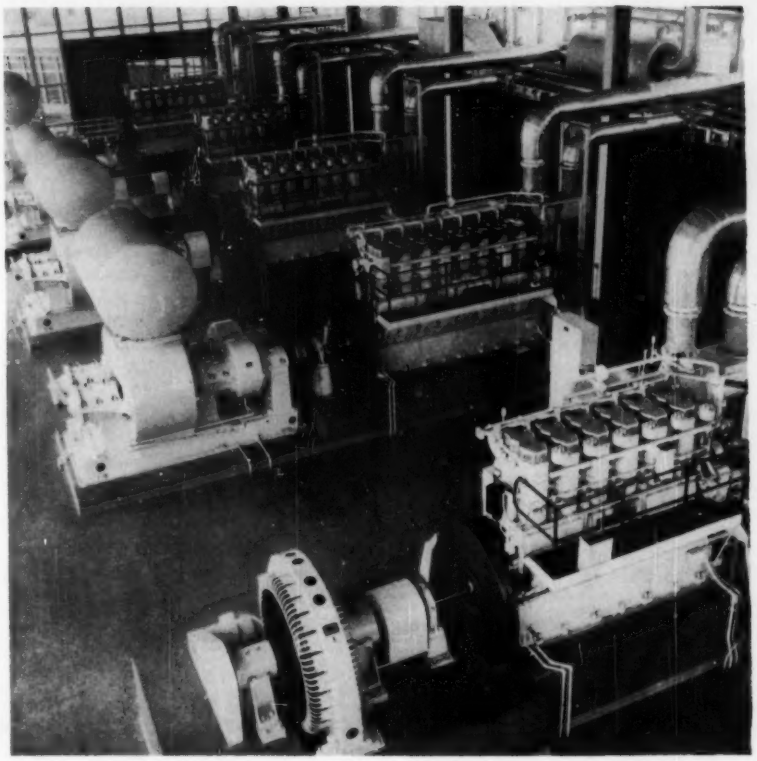
Raw sewage enters the plant through a lift station to allow gravity flow through all treatment phases. The lift station has one new Worthington pump with a capacity of 57.5 mgd against a 38½-foot head and four older pumps able to deliver 35 mgd against a 34-foot head. One of these is driven by a Rathbun-Jones gas engine. The rest are electrically powered.

After a lift of 30 feet, sewage is passed through coarse screens to a pre-chlorination point and detritor building. Here the sewage enters two 40-foot-square Dorr Detritors that remove heavy sand and similar material.

The grit-free sewage is then directed to pre-aeration units, where compressed air is introduced and separation and skimming of greases and collection of sludge is provided. Primary settling then follows, accomplished by eight settling tanks, each 90 feet square and ten feet deep, equipped with Dorr traction sludge collecting mechan-



The central control room provides complete monitoring and recording of the operation of the treatment plant. Fischer & Porter instrumentation and General Electric control panels are set in a color-coded diagrammatic flow chart.



Main sources of power and air are the five Enterprise tri-fuel engines which drive the four Roots-Connersville blowers together with the General Electric generator in the foreground.

isms. The tanks provide a detention period of two hours and an overflow rate of 1,100 gallons per square foot of surface area per day at the design flow of 70 mgd.

Sludge from the settling tanks is transferred by a pair of Yeomans sludge pumps to eight digesters, each 85 feet in diameter and 29 feet deep, with fixed covers and Dorr stirring equipment. At the design flow of 70 mgd, these digesters provide 2.89 cubic feet of volume per person, based on an equivalent population.

A long connecting channel directs the settled sewage to the aeration tank, where it is mixed with returned activated sludge for the destruction and stabilization of organic materials. In the mixed-liquor tanks the mixed sewage and activated sludge absorb large quantities of dissolved oxygen provided by the compressed air blowers.

There are five engines that provide power for the principal equipment in the new secondary facilities. All are Model G series, 4-cycle, tri-fuel engines that operate on diesel fuel, dual fuel or spark ignition manufactured by the Enterprise Engine & Machine Co., San Francisco.

Four of them drive blowers to compress the air used in the aeration tanks, with three of them normally in operation and the fourth unit serving as a stand-by to be used as needed. The fifth engine drives a three-phase, 60-cycle, 480-volt General Electric generator with a production rate of 350 kilowatts at 400 rpm.

The first of the blower engines is a Model TDGSG-8, normally aspirated, eight-cylinder Enterprise that develops 425 horsepower at 327 rpm. It drives a Roots-Connersville Model RCDH, 36-inch x 39½-inch blower which provides 20,000 cfm at 4 psi. The four-pound air is developed in a separate system and circulated in the upper portion of the aeration tanks.

The other three blower-drive engines are Enterprise Models TDGSG-6 and TDGSG-38, which drive Roots-Connersville blowers rated at 10,000 and 20,000 cfm of

High-concentration aeration tanks are equipped with Chicago Pump aeration systems supplied with blowers that have a potential 80,000 cfm capacity.

air respectively, at 8 psi. The eight-psi air is required at the bottom of the aeration tanks, twice the pressure desired for the upper portions of the tanks.

For stand-by air production, an Electric Machinery Company motor drives still another Roots-Connersville Model RCDH blower, rated at 10,000 cfm of eight-psi air. This unit will perform should there be a shutdown of fuel-driven engines in the plant.

With a total potential air production of 80,000 cfm, the plant needed special air-intake design requirements. Two openings, each about four feet wide and eight feet high are equipped with screens for coarse material and fiber glass filters to collect finer dust particles. The air is then passed through a fine oil spray that collects even finer particles and finally it is passed over electrostatic precipitators that attract even the finest remaining airborne particles.

The seemingly excessive straining and filtration of intake air is expected to more than pay for itself in added years of operation in a dust-free atmosphere that is clear of all abrasive particles.

Following aeration of primary effluent, the mixed liquor flows to final settling tanks, from which final effluent is discharged to the river. During summer months this effluent is chlorinated.

Some sludge from the final tanks is pumped to the digesters, but the major portion is returned to primary effluent and to nitrification tanks.

The six final settling tanks are octagonal - shaped, 112 feet across and 12 feet deep, with bottoms filleted to accommodate Chain-Belt Uni-Tube sludge collectors. These provide a detention of 1.85 hours and an overflow rate of 9,500 gallons per lineal foot of water per day.

During operation of the original primary system, digested sludge was ground and bagged to be sold by the city as a commercial soil conditioner under the trade name "Tol-E-Gro." This material has been marketed for 20 years. The sludge is pumped by positive displacement pumps to 3¾ acres of glass-covered drying beds. The soil conditioner plant, which contains a Gruendler Pulverizer and St. Regis Paper Company automatic bagging machines, is presently leased out to a private contractor for operation under the control of the city. He packages the dried, ground product in 25- and 85-pound bags for sale to the public.

A central control panel monitors and records all phases of the operation through the use of Fischer & Porter instruments and General Electric control panels. Chlorination is by two Fischer & Porter 6,000-pound units teamed with a 4,000-pound Wallace & Tiernan unit.

Sludge gas, formed in the digesters, is pumped to the gas compressor building and stored in one of two spheres. As tri-fuel units, the Enterprise engines operate on diesel fuel, natural gas, sewage gas, or a mixture. A controlling unit raises the BTU content of the fuel by automatically mixing sludge gas with proper quantities of natural gas, using an optical sensing device. Annual savings through the use of sludge gas amount to an estimated $50,000.

With the engines in operation, heat normally required for the plant and processes is obtained from the jacket water and waste heat mufflers.

Laboratory technicians check the plant flows hourly for the pollution content to ensure 85% removal of objectionable material. It has been established that effluent from the plant will greatly ease pollution in the Maumee River and Bay.

Incorporation—Neither Good Nor Bad

A California legislative committee has tried to determine whether the current trend toward incorporation is good or not. On the basis of its findings, the committee concluded that it is neither good nor bad *per se*. The committee recognized the view, also held by many experts in the field of government and local government officials, that a number of these new cities perhaps should not have been allowed to incorporate.

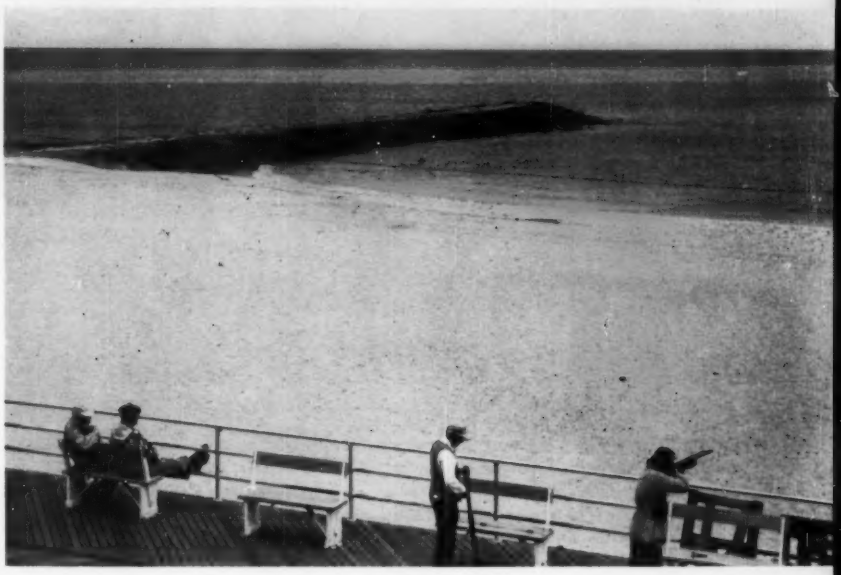
Cited as examples were those which incorporated principally to keep from being annexed to a neighboring city and turned to the incorporation laws merely to protect their "unincorporated" status. Other so-called problem cities were those which incorporated to exclude business and manufacturing, desiring to remain strictly residential in character. Of course this type of incorporation must sacrifice certain traditional city sources of income, such as the sales tax, alcoholic beverage tax, business license fees, etc. It was therefore believed that some time in the future many of these cities would be forced to consolidate with another city or disincorporate.

The committee's study, however, would appear to indicate that these fears can be allayed. There seemed to be few signs of dissatisfaction or serious problems besetting newly incorporated cities. The principal threat to their continued existence would appear to be a possibility that several with an extremely low tax base could experience difficulty if at some time in the future their citizens should demand a higher level of service; then it would be a serious problem only if there were no available means of expanding the tax base.

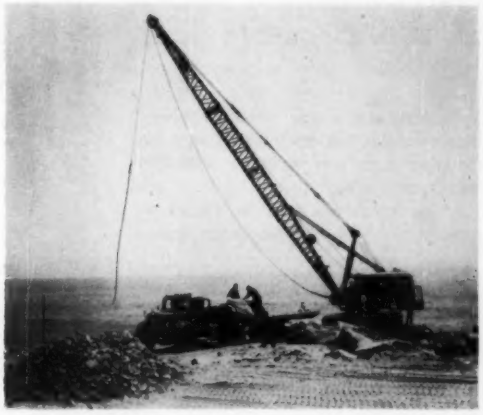
New Type Jetty at Asbury Park N. J.

Asphalt grouting promises greater resistance to ocean wave action and improved usefulness of the beach area

By KENDALL H. LEE
City Manager



The finished jetty has its inner core strengthened with the asphaltic grout under the present program (above).



A Bucyrus-Erie crane places the heavy stone used as the walls of the shore-protecting jetty.

A 600-foot jetty reaching out from our recreational beach-front may write a new chapter in the important textbook of beach erosion control. It certainly must be counted among this city's most important experimental investments. Asbury Park's beach front is one of its great natural resources. It brings happiness and relaxation to many thousands of people, particularly during the hot summer months. While the ocean is our ally in helping make this great advantage possible, at the same time it is our opponent because the strong ocean currents will quickly destroy our beach front unless we protect it.

The new jetty will have a total length of 600 feet, measured from the easterly side of the boardwalk. The first section of 150 feet is composed of heavy timber bulkhead of solid sheathing and piles designed to retain the sand during a severe storm. The outward 450 feet will be of rock construction, with large stones weighing between two and eight tons, with a center core of smaller stones. The top of the stone jetty will receive a concrete filler to a depth of 18 inches or more, extending to a point about 400 feet from the boardwalk.

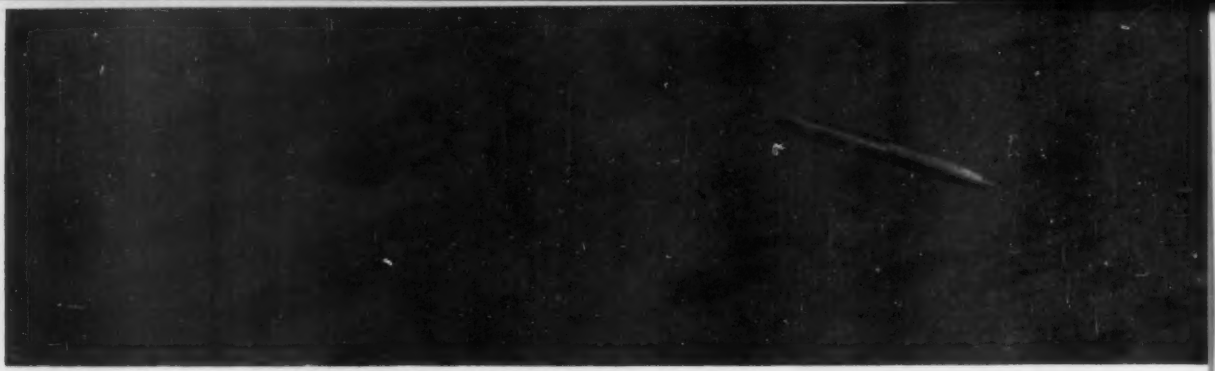
The remaining seaward end of the jetty will receive an asphalt grouting and capping mix which will completely fill all voids between stones down to a point below water. This asphalt grouting is a new idea along the eastern seaboard and was advanced by Mr. William Birtwell, our city engineer. The purpose of the asphalt grout is to prevent displacement of the large cap stones which normally occurs during severe storms. It should accomplish this through the fact that the outward end of this jetty will become a monolithic structure, better able to withstand the forces of the ocean. We are experimenting with an idea which, if it proves itself, can save the state and municipalities millions of dollars in maintenance. Mr. Birtwell has spent much time and effort over the past several years developing this idea and we are anxious to see how well it works.

As for the balance of the jetties, they are for the most part similar in length, shape and design to the new jetty, with the exception of the asphalt grouting. We place the jetties about 1,600 feet apart.

Looking to the future, our jetties can provide for greater benefits than we now receive, by extending the rocks another 200 feet and placing broad T's on the ends. This construction would build up our beaches along the jetties, make them wide, and allow for bathing during rough weather. The T's also might provide breakwaters for small boats, and certainly the curved beach would become sheltered areas of mild action for children.

Another unusual feature of our jetties is the fact that the flat top created by filling in the voids with concrete, and in the case of the new jetty, asphalt, makes excellent fishing piers.

The cost of the newest jetty is $150,000. Of this, the state contributes 50%, the county 10%, and the city 40%.



The liquid mastic forms a smooth, dense surface without rolling.

Foamed Asphalt

By the use of this new process developed at the Bituminous Research Laboratory of Iowa State University, three new paving mixes were laid commercially for the first time and tested in the City of Dubuque, Iowa. The new mixes include a liquid-mastic asphalt paving mixture for thin-layer resurfacing, an asphalt-cement slurry seal, and a long-time stock-pile patch material that can be placed in wet and cool weather.

By **K. J. CULLEN***
City Engineer

A machine-laid mastic asphalt pavement, a cold-patch mix that can be placed in wet weather and does not pop up or push, a slurry seal that is extremely tenacious and resistant to wear; these are but a few of the advantages obtained through the use of foamed asphalt in bituminous mixtures. These materials were used for the first time on a commercial scale by the City of Dubuque, Iowa, working with Ladis H. Csanyi, Professor in Charge, Bituminous Research Laboratory, Engineering Experiment Station, Iowa State University, and the Schueller Blacktop Company of Dubuque, Iowa. Streets surfaced or sealed with foamed asphalt used in the bituminous mixtures show no signs of wear after four to five months of service; cold patches are holding up well.

Our work consisted of using three basic mixtures: a plant mix that we call foamed-asphalt liquid mastic, an asphalt-cement slurry used for seal coating, and a stock-pile mix used for patch work.

We use this material for resurfacing old concrete streets as well as existing bituminous pavements, applying a mat about ¾ to 1 inch thick. We also paved a parking lot and park access road with this material using a 1¼-inch-thick mat over a 6-inch rolled stone base.

The aggregate used in the relatively thin-layer foamed-asphalt mastic surface mix is an agricultural limestone. This is a waste product of the local limestone quarries and is relatively cheap and available in ample supply. Our specifications state that all particles in the aggregate shall pass the No. 4 sieve and be graded fairly uniformly down to the No. 200 sieve, with at least 8 to 15 passing the No. 200 sieve in a dry gradation test. The following table shows the analysis of two samples after extraction from the mix.

Aggregate Gradation

Sieve	% Passing (Sample #1)	% Passing (Sample #2)
¾"	99.5	99.4
No. 4	94.5	93.6
No. 8	75.3	72.8
No. 40	48.6	38.9
No. 80	28.8	23.7
No. 200	11.5	12.0

Asphalt Content Runs 9.5%—10.2%.

The asphalt cement used can be either 100 to 120 penetration or 150-200 penetration.

The aggregate is heated to 400°-420°F before going into the mixer and the asphalt cement must be at least 280°F. About 10% foamed asphalt is introduced by the foamed-asphalt process during mixing, with regular mixing procedures employed for at least one minute.

A regular bituminous paver applies the material to the street surface at a temperature between 325-400°F. The material being laid has

The liquid mastic can be placed by a standard bituminous paver.

* Mr. Cullen has been Dubuque's City Engineer since August 1951. He was President of the Iowa Chapter of the APWA from October 1956 to October 1957 and served as Iowa District Representative of the APWA in 1958. He will serve as District Representative again in 1960.

Foamed asphalt slurry is mixed in paste form in a batch plant, then transferred to a drum mixer and thinned with water to the desired consistency.

a consistency like that of heavy molasses, has a rubbery nature and is extremely adhesive, generally requiring no prime on concrete or asphaltic surfacings. However, these surfaces should be broomed clean and cracks blown clean of dirt and debris. Shallow depressions need not be filled, but those over 2½ inches deep should preferably be plugged. The mastic asphalt mix in place weighs about 115 pounds per square yard per inch of thickness. One ton of this material will cover approximately 23 square yards at ¾-inch thickness.

The liquid-mastic asphalt mix cures rapidly, permitting traffic to be resumed about two to four hours after completion of the work, depending upon the air temperature. This surfacing carries fairly heavy traffic and is quite skid resistant.

Aggregate used in the foamed asphalt cement slurry consists of agricultural limestone having the same gradation that is used in liquid-mastic asphalt mix plus about 10 to 12% of clayey soil, depending upon the character of the stone. Asphalt cement is also of the same grade.

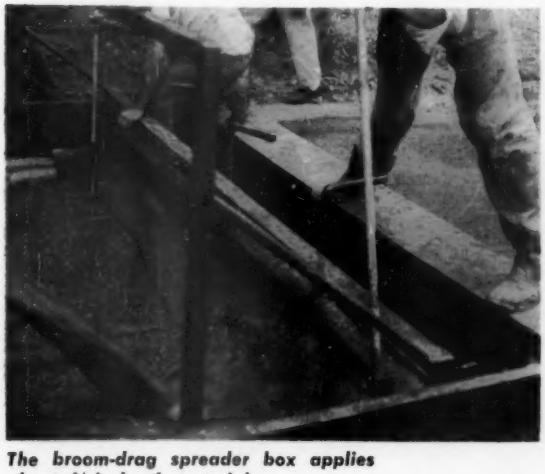
The slurry is prepared in two steps in a batch-mixer plant. The first step consists of preparing an aggregate and water paste followed by the addition of foamed asphalt which forms the asphalt paste. The asphalt paste is then transferred to a concrete mixer (transit-mix truck in our case).

About 13% water by weight is used to form a smooth aggregate paste and about 13 to 14% by weight of foamed-asphalt cement is added to produce a good asphalt paste. Mixing should continue for at least a minute or until the mixture is smooth.

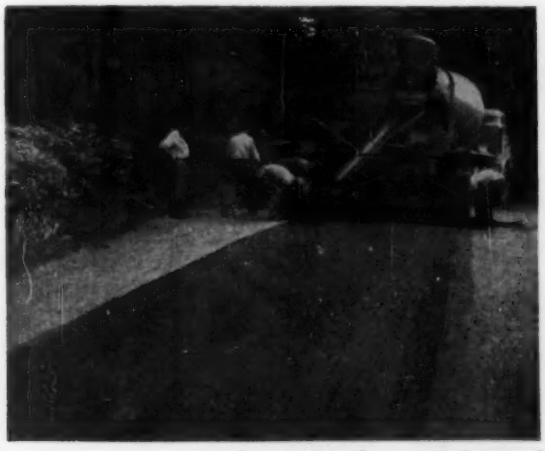
After transferring the asphalt paste to the concrete mixer, additional water amounting to about 15% is added slowly until the desired slurry is obtained. We applied the slurry by means of a broom-drag spreader box, pulled by the transit-mix truck at about one mile an hour, laying a seal coat about ⅛-inch in thickness. This amounts to about ten pounds per square yard.

In preparing the foamed-asphalt stock - pile mix we use a limestone aggregate all of which passes a ⅝-inch sieve and is uniformly graded down to a No. 200 sieve with from 4 to 8% passing the No. 200 sieve. Asphalt cement may be either AC 100-220 or AC 150-200 penetration.

In producing the patch material the aggregate is dried and heated to 250°F or over and then placed into a standard pug-mill mixer where 6 to 6½% foamed-asphalt cement is added by the foamed-asphalt process. As soon as the regular mixing procedure is completed the material is cooled by spraying cold water on it while still in the mixer. Additional cold water is sprayed on the mix as it falls



The broom-drag spreader box applies about ⅛-inch of material . . .



. . . to the street surface as it is towed by the transit mix truck.

from the mixer. This is stockpiled in piles not higher than four feet or about three feet if it is to be stored for some time. This precaution is necessary since the bottom layer of the mix will compact and set up merely from the weight of the pile.

When used directly for patching, the patch area is first primed. A little water added to the mix when placed in the hole helps workability and a suitable roller or compactor should be used for final compaction.

This material also works well when put through a tail-gate mixer-heater. In this case the patch area should be primed and the heated mix placed while warm.

We have also used the foamed-asphalt process for the pre-coating of ⅜-inch clean limestone aggregate for seal coat chips when sealing with the conventional cut-back asphalts. This has proved to have many advantages over the conventional cover aggregate. The extra cost of precoating is offset by using less aggregate and asphalt. Scatter of chips and dust nuisance of regular seal coats is practically eliminated.

On one job we placed a 1¼-inch mat of liquid-mastic asphalt mix over a 6-inch rolled-stone-base parking lot and a 6-inch rolled-stone-base access road having had several seal-coat applications. The total area paved amounted to 13,773 square yards. This required 951.84 tons of asphalt at $11 a ton and 550 gallons of prime coat at $0.20 a gallon or $0.768 per square yard.

We also laid 24,596 square yards of ¾-inch-thick liquid-mastic asphalt surfacing on downtown streets and three streets leading to residential districts on a hill. The latter had grades of 10%, 11% and 12%. The cost of this work, including clean-up and patching, amounted to $0.618 per square yard. Most of this was on concrete streets 30 to 40 years old — downtown streets which included intersections with brick surfacing. After five months, this new surface shows no sign of wear. The streets in the downtown area carry approximately 13,000 cars a day and 1,000 cars an hour at peak load, while the three streets leading to the residential area on a hill carry 10,000 vehicles a day.

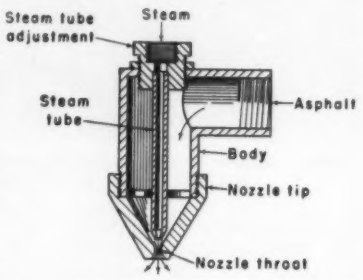


Figure I—Cross section of foamed asphalt nozzle.

The slurry cement was used on three projects. Unfortunately, heavy rains came shortly after completion of two of these, so the results were not too gratifying. However, the third job shows no sign of wear after six months of service. Professor Csanyi is now experimenting with various mixes to speed up curing to avoid damage caused by sudden rain storms. Curing now takes about two to six hours.

The trick in preparing foamed asphalt is in controlling the foam. This can be done by means of a special nozzle which instantaneously generates an asphalt foam of the desired character and in suitable quantities. The foamed-asphalt process and foamed-asphalt nozzle developed at the Bituminous Research Laboratory of the Iowa Engineering Experiment Station under Professor Csanyi's direction utilizes steam to produce the foam.[1]

Figure I shows a cross section of the nozzle. Asphalt cement is introduced into this nozzle at 280°F or over, at about 25 psi, while saturated steam is introduced at about 40 psi. Foam is instantaneously generated as the asphalt and steam meet in the tip of the nozzle. The character of the foam generated depends upon the design of the tip, the quantity and pressure of the steam and the pressure of the asphalt. Once the character of the foam has been selected, these variables may be set so that the nozzle will produce the desired foam consistently.

Batch type plants may be converted to produce foamed-asphalt bituminous mixes as shown in Figure II. Spray bars hooked up to a portable steam generator and an asphalt supply may be used on commercial mixers to produce the material. By properly positioning the nozzles on the spray bar and the spray bar over the mixer, a uniform distribution of the foamed-asphalt into the mix may be secured. The foamed-asphalt may be applied continuously on continuous mixes or intermittently on batch mixes with no clogging difficulties on the intermittent operation because the steam keeps the nozzle hot and blows the nozzle clear.[2]

All material used by the City of Dubuque was mixed in a batch plant as described under the various types of foamed-asphalt material. However, the Bituminous Research Laboratory of Iowa State University has conducted experiments using local ungraded aggregates mixed with commercial mixers and stabilizing machines equipped with spray bars as previously described.

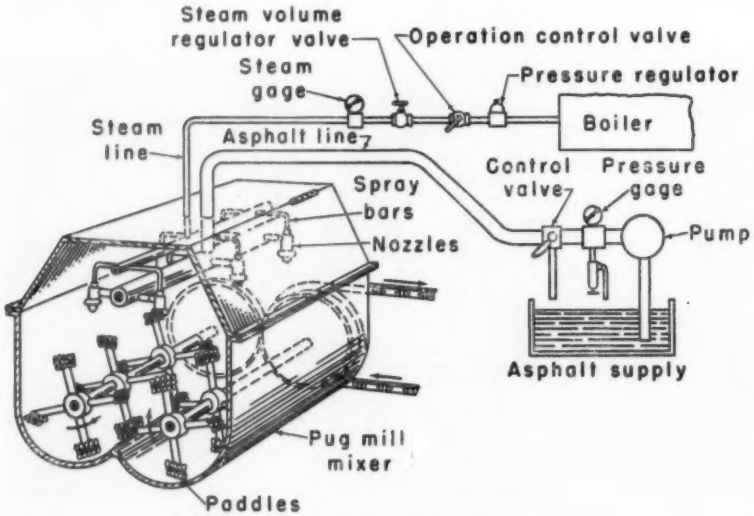


Figure II—Diagram of foamed asphalt system.

[1] The foamed-asphalt process and the apparatus is patented by the Iowa State University Research Foundation.

[2] More information on the foamed-asphalt process, the apparatus and various experiments is available in Bulletin 160, Highway Research Board, National Academy of Sciences, National Research Council, Washington, D. C. and Technical Bulletin No. 240, 1959, entitled, *Foamed Asphalt*, by Ladis H. Csanyi and published by the American Road Builders Association, World Center Building, Washington, D. C.

Camden, S. C. Puts Its Welcome In Writing

Rarely, these days, does an out-of-state motorist park his car anywhere in Camden, S. C.—even for a few minutes—that he is not startled upon his return by a very official looking "parking ticket" attached to his windshield wiper.

He finds, however, that instead of a summons to pay a parking fine or to spend the night as "guest" in the city jail, the eye-catching tag is a direct line of communications with Camden's Mayor E. C. Rhame who fostered the idea as a welcoming device—with several incidental advantages.

On the face of the ticket are the words "Welcome to the City of Camden," with authority for the visitor to park for "as long as he wishes" in an unrestricted parking area. It expresses the hope that he will enjoy his visit and that information can be obtained at the City Hall or the Chamber of Commerce Office. This side also provides a space for the name and address of the visitor and for his impressions and suggestions.

On the reverse side is a list of points of interest offered by Camden and the surrounding countryside together with a business reply card designation for the detachable stub, which is addressed to the mayor and requires no postage if mailed in the United States. Tickets are attached during routine parking patrol.

The South Carolina city has many out-of-state visitors, some who are in Camden to enjoy historic landmarks that abound in the area or to attend colorful Carolina Cup Races that are annual events there. Still others are enroute to or from resort areas of the Southeast and are just passing through.

The problem of welcoming people who may never have contact with the official side of the city presented obstacles, until the "parking ticket" idea evolved. Mayor Rhame and City Manager Max Holland teamed up to make sure that most out-of-state car owners not only remember Camden, but that they also have an opportunity to pass judgment on their treatment in the city.

The mayor believes that compliments from strangers build the inspiration needed by officials and city workers for best performance of their duties. He also believes that a device that presents an opportunity for those same officials to hear criticisms provides a challenge to do an even better job.

Welcome TO
THE CITY OF CAMDEN
This tag is your authority to park as long as you wish in any unrestricted zone.
I hope your visit here will be enjoyable and that you will have time to see our city. Any information you desire about Camden may be obtained from the City Hall or Chamber of Commerce office.
I wish you a pleasant safe trip to your destination and hope you will visit us again very soon, for a longer time.
E. C. RHAME, Mayor
(See Other Side)
We are interested in knowing who visits our city. Won't you do us the kindness of filling in this card? Drop in any mailbox. No postage required.
Name
Street
City
Comments
CITY OF CAMDEN
1732
VISIT THE FOLLOWING PLACES OF INTEREST:
★ CITY HALL
★ OLD COURT HOUSE
★ SPRINGDALE RACE COURSE
★ GRAVE OF AGNES OF GLASGOW
★ QUAKER CEMETERY
★ BETHESDA CHURCH
★ KERSHAW COUNTY PARK
★ CAMDEN COUNTRY CLUB
18 Hole Championship Golf Course
No Postage Stamp Necessary If Mailed In The United States
BUSINESS REPLY CARD
First Class Permit No. 20, Camden, S. C.
Postage Will Be Paid By Addressee
E. C. RHAME, Mayor
CITY OF CAMDEN, S. C.
1000 Lyttleton Street
Camden, S. C.

From a distance Camden's Public Relations device looks like a parking ticket. Closer inspection brings welcome relief and warm greetings to the out-of-state driver.

The response has been almost unbelievable. From approximately 3,500 cards distributed since the beginning of the program, more than 1,000 have been returned from cities across the nation. There have been replies from Toronto, Canada; Fresno, Calif.; St. Paul, Minn.; Guilford, Me.; Carroll, Ia.; and even one from Blackburn, Lancashire, England; and one from Allbrook Air Force Base, Canal Zone.

The character of remarks ranges from high praise to criticism and from humorous experience while in the city to a description of how it feels to be in a strange place and find your car ticketed for no apparent reason.

One couple stated that the general atmosphere of Camden—but mostly the friendly impression of the "parking ticket"—had convinced them that they should change their plans and retire to Camden, rather than to the city that they had chosen some years before.

Mayor Rhame passes the most interesting comments on to the local newspaper—including those that are critical—and townspeople have developed a real interest in discovering the impressions made by their community on visitors.

Twenty-seven packer collection units pick up refuse twice a week from residential areas and make daily garbage collections in the commercial areas.

Sanitary Landfill Pushes Back the River

Topeka, Kan. combines sanitary landfill operations with river shoreline reclamation work

By **ROY LUCE**, Director
Department of Refuse

Author Luce stands on what was water as recently as last spring. Note the sediment resulting from jetty construction in the background.

A sanitary landfill can be more than just a highly successful trash and garbage disposal operation. Here in Topeka we are using it as a satisfactory means of helping reclaim lost river shoreline.

The Kansas River, when it flooded during past years because of heavy rains, cut a new river bed nearly half again as wide as its original bed in some areas downstream from the city. [illegible] meant a loss of shoreline var[illegible] from 40 to 60 feet in width. In some cases the situation is worse, for the river undercuts sandbanks underlying bottomland farms. One farmer lost almost 65 acres in this way.

Although the farmland is gone,

This modified dozer blade can handle almost twice the normal blade load; the beach area to the right of the tractor will eventually be filled and covered.

The barren mudbank along the Kansas River will eventually be raised to the elevation of the vacant buildings in the background.

much washed-out shoreline can be restored and the river pushed back into its original bed. The City of Topeka is doing this at two of its three landfill sites.

Restricted Operation

One of the reclamation projects is a river-front site approximately 1,000 feet long located adjacent to the city's sewage treatment plant. This is a restricted operation limited to the disposal of trees, broken pavement, stone, waste dirt and other waste taken from construction jobs.

Trees and limbs are burned off when possible, and all material is dumped over the face of the bank onto the shoreline shelf. At this point the bank rises approximately 30 feet above normal water level.

We built a jetty from fill material out into the river to the point of original shoreline to gain additional shoreline and push back the river. The jetty diverts the river current, thereby creating a settling pool on both the upstream and downstream sides. Because of the river's heavy silt content, these fill quickly with sediment, and when exposed by lower river levels, this sediment becomes available for fill.

One spotter on duty during all hours the site is open directs and controls all dumping. Restricting the type of material accepted simplifies control and maintenance and the operation does not require keeping machinery on hand for moving the fill or compaction. The only cover used is that brought in by contractors as waste dirt from excavations. To date, we have moved the water back about 200 feet at this site.

The second shoreline reclamation project, located several miles farther downstream, is open to the public for dumping from 8 A.M. to 7 P.M. seven days a week. It covers 90 acres along the river and is used for all refuse excepting garbage and dead animals. About 300 yards is river-front footage, with most of the land being relatively low and ex-

This one tractor easily handles nearly 120 tons of refuse daily at one sanitary landfill site.

posed to flooding during high water periods.

Here we follow a somewhat modified ramp technique, dumping material either down the face of the bank or near the edge and then dozing it into place down a ramp and compacting it. For this operation we use a Caterpillar D-7 Tractor with a straight blade. The light, loose nature of most of the material permitted us to modify the blade to handle nearly twice a normal blade load by welding on an upper guard.

After filling with compacted material to within about two feet of the overall desired elevation, an area is brought to level with cover dirt dozed in from nearby higher city-owned land. Final elevation will be about 20 feet above normal river level at this point. Since the river cut out a wide strip of shoreline at this point also, a jetty similar to that used on the other reclamation project will be built.

This site is located slightly more than three miles from the city limits and is about two miles from the nearest habitation. Presently we follow a policy of burning off the combustible material at the end of each day.

The city has operated this site for nearly five years and we expect it to be serviceable for at least ten more years.

The third operation is a sanitary landfill used for disposal of all refuse collected by the 25 packer trucks operated daily by the city. Containing 57 acres and on a site of bottom land that adjoins the river, the landfill handles an estimated 120 tons of material daily. It has been in operation only since the early part of May this year and is currently being worked several hundred feet from the river at its nearest point.

At this site we utilize a combination ramp-cut and cover method for handling of the fill. A Cat D-6 Tractor and a No. 60 Scraper first make a wide cut approximately 100 feet long and down to water level—between six and eight feet. When the cut is finished, the scraper is detached and a straight bulldozer blade used to push refuse onto the ramp and compact it. As soon as trucks discharge a load, it is dozed onto the pile, and compacted. When all the material is on the pile, the operator begins dozing cover material from the stockpile or adjacent area. Refuse is covered as quickly as possible and cuts are made generally only once each day. We use between 12 and 18 inches of cover dirt.

As more trucks arrive, the cycle is repeated. We also maintain a Cat D-4 Tractor at the site, using it for utility work, such as helping trucks through soft spots and for small dozing jobs.

Final Elevation

Final elevation of this area will be about four feet above the original ground. This operation is open six days a week and is used only to dispose of material collected by city-owned trucks.

Under previous arrangements, we disposed of garbage through local hog farmers, but we discarded this system because of general dissatisfaction with its efficiency and for health precautions.

The Refuse Department has an annual income of approximately $465,000, derived entirely from a service charge, and employs 105 persons on a full-time basis. We have a fleet of 30 packer units consisting of 18 Hydepaks; four Hydro E-Z Packs; two Gar Woods; four Leach units, and two Heil units. Twenty-seven are kept in constant service with three serving as standbys. The longest one-way haul to the sanitary landfill is 13 miles, but most hauls are much shorter.

The Department makes twice-weekly collections at each of the approximately 30,000 residences inside Topeka's corporate limits. Daily collections are made at all commercial stops. With our present system of disposal, garbage must be separated from other material but is picked up in the same truck, a considerable improvement over our former method of operation.

We charge single residences $1.35 per month for this service and include this on the monthly water bill. This combining of bills eliminates some duplication of office work and also insures payment of the fee. Residences equipped with a disposal unit receive an exemption of 60 cents monthly.

Although there is no limit on the number of cans per stop, we do request patrons to carry cans to the street curb on collection days. On the other hand, our personnel are instructed to go to the rear of the houses, if necessary, to get the refuse rather than not provide the service.

The author points to an area to be checked by foot patrolman Charles Graves during his patrol.

Mrs. Jean Carr, Dunkirk's parking enforcement officer, in the police jeep.

The Foot Patrolman Prevents Crimes

By **RICHARD M. KINN**
Chief of Police
Dunkirk, N. Y.

During recent years many cities throughout the nation have taken their foot or beat patrolmen off the streets and placed them in patrol cars. But not Dunkirk, N. Y., with its population of 22,000.

The Dunkirk force consists of five lieutenants and 21 patrolmen working three eight-hour shifts. Three patrolmen are always walking a beat, while two officers in a patrol car travel areas not covered by the foot patrolmen such as industrial and certain residential streets.

After 18 years as a police officer my belief is that the way to control and prevent crime is to have some of our men walking beats at all times. Numerous cities have taken their foot patrolmen off the streets, but today many law agencies believe this reliance completely on patrol vehicles was a mistake and again are considering the advantage of foot patrolmen in combination with patrol car duty. This acts as a one-two punch.

The specific purpose of a foot patrolman is to prevent crime. It is not enough to put men on the streets. They must be assigned to sections where crime is likely to happen. Also, the size of the beat must be regulated. For instance, in our Central Avenue shopping district we have two banks and three jewelry stores in addition to other business establishments. The property and merchandise value is very high on Central Avenue, as well as the crime temptation factor. Therefore the foot patrolman assigned to that district will cover a smaller beat than that covered by a foot patrolman in another section of the city.

The officer's attention to banks and business occupancies, their hours of doing business and their daily routines such as lights burning at night for protection, receiving and discharging money for deposits and payroll purposes, etc., reduces the danger of crimes being committed against such businesses.

Our foot patrolmen will listen and act on complaints, give information and settle disputes. Each Dunkirk foot patrolman spends eight hours on a beat. Each beat patrolman calls in every 45 minutes from one of the 37 Gamewell police patrol boxes.

The instruction and education of businessmen in the techniques and procedures they should observe to prevent crime against them can be effectively imparted by the foot patrolmen in their district. A reduction in delinquency and crime is more readily effected by a foot patrolman among the children and the public on his post.

All our Dunkirk beat patrolmen are instructed to be observant. They should notice important things and thereby sub-consciously note anything unusual in later patrol. Also, our men are instructed to vary the patrol. This means that the route of patrol taken by the patrolman should not follow a set pattern. If it does, it is easy for anyone to know exactly where the patrolman will be at any particular time and that knowledge will aid that person in planning his crime. Our men are also told to familiarize themselves with all conditions on their beat that may eventually lead to police problems, such as the presence of street gangs and dangerous conditions.

The police training school at Mayville, N. Y., county seat of Chautauqua County, is sponsored by the County Chiefs of Police Association and the Sheriff's Department. All men on the Dunkirk Police force are required to attend the school, at no expense to the taxpayer, except for gas mileage (and usually five or six men leave from Dunkirk in one car, reducing the cost even more).

Mrs. Jean Carr was appointed on September 15, 1958 to the parking enforcement officer post, as well as acting as police matron for the Dunkirk force. Her job is to enforce parking and check parking meters and help children and elderly persons across busy intersections.

Conversion of one garage to a repair shop (right) and construction of additional vehicular storage space (center) has increased the efficiency of the city's garage and repair facilities.

Alton on the Upgrade

An Illinois city shakes off complacency and takes active steps toward needed civic improvements

By **GRAHAM W. WATT***
City Manager

Alton is a relatively old city, established in 1833, but it is firmly on a constructive path to the future. From its early years as a bustling river town it has grown to its present status of service to a wide area of well-known industries.

Unfortunately, during this transition, complacency led to a degeneration of municipal services as well as physical appearances in the city. However, in 1957, following a spirited campaign, the voters insisted on a change to the council-manager form of government and the new administration moved to institute a number of new improvements.

Several of these have attracted immediate public attention. The first was a street-sign program.

During 1958 the city replaced over 100 stop signs with signs using standard red Scotchlite reflective sheeting. The old fixtures were bent, rusted and faded. Many were too small and were mounted at varying heights. The new signs, all 24 inches in size, are mounted according to the standards of the Manual on Uniform Traffic Control Devices.

Parking-control signs came next. In the past the city tried to economize by making its own signs but they were usually short-lived. Now it uses a standard sign fabricated of baked enamel on steel with silk-screen legend. Most signs are 12 inches by 18 inches in size and all are mounted at standard heights.

The new administration also went to work on street-name signs. The old ones, of many types and varieties, were small; some had been repainted and most were mounted with only one side showing on each street. The new ones, 24 inches by 6 inches in size, are made of aluminum and bear black letters on a silver Scotchlite background. The letters are four inches high and all signs are mounted at a standard height of eight feet. The entire assembly—sign base, mounting bracket and post—is aluminum.

Available funds did not allow the placing of new street-name signs at all intersections immediately. Therefore the program was started by placing them at the intersections of all major streets and thoroughfares, and then at the intersection of minor streets with major streets; the balance of the program will complete the work. This year's budget allocated $3,500 for traffic and street-sign materials.

Initially all new signs were purchased fabricated. However, the city recently purchased a Minnesota Mining and Manufacturing Company Scotchlite applicator; we expect savings sufficient to cover the cost of the machine in about two years.

The street-marking program has been stepped up to provide painted cross walks, parking stalls and lane lines throughout the city's four retail business areas and along major streets. The city has purchased an M-B Corporation Linemaster traffic-line marker to do most of this work. All parking-meter posts were repainted last year and the city is now refinishing parking-meter heads as part of its meter maintenance and repair activity. In the central business district, all on-street parking has been changed from angle to parallel with the "paired parallel" system used. In these locations, meters are dual-mounted on a single post, thus helping to alleviate street "clutter" in the downtown business area.

In former years street sweeping was a neglected item. The city purchased an Elgin sweeper and

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* Graham W. Watt, Alton's first manager, is a graduate of Washington College and the Fels Institute of Local and State Government of the University of Pennsylvania. He was employed by the City of Kansas City, Mo. for seven years, serving for three years as Administrative Assistant to L. P. Cookingham.

Improved lighting in the commercial areas did much to brighten the city and increase safety and business activity.

placed it in service late in the summer of 1958. This machine operates on a five-day-per-week schedule, beginning at 2:00 A.M., sweeping first the business areas and then moving into the residential districts. The central business district is swept three to four times each week as needed while the outlying business areas are swept from two to three times per week. Residential streets having curb and gutter are swept four to five times a year.

Last winter the city experienced the benefits of a 100% salt ice-and-snow-control program. This change meant cleaner streets during the winter and spring.

City crews stockpile the bagged salt and apply it to the icy streets with two Tarco Scotchman and one Baughman spreaders. During the past summer, street department employees mounted an overhead storage bin that will be used for gravel in the summer and salt during the winter. A small stockpile of calcium chloride is on hand for use during periods of very low temperatures.

Even small items have not been forgotten. Alton has many red-brick streets. This type of paving brick is no longer available and it is often necessary to repair utility cuts with concrete. The city now colors the concrete red to make these patches much less noticeable.

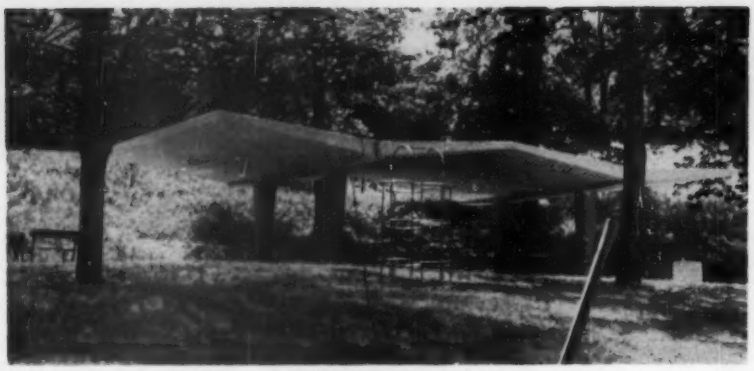
These brick streets present some problems for street-sweeper operation, particularly in residential areas where the traffic is not heavy enough to keep weeds and grass from sprouting in the parking lanes.

The new, readable and reflectorized street signs, uniform in location and height, were well received by Alton residents.

Last spring, the city sprayed a non-selective weed killer along the curb and gutter lines to inhibit this growth and, despite the wet season, the experiment was considered successful and will be repeated.

Improved street lighting also adds to the appearance of the community. This program is explained in more detail in the lighting section of this issue. (See page 121).

Centralized garage and repair facilities is another accomplishment that pays dividends to Alton taxpayers. Originally the sanitation department used one building and the street and sewer department another building located on the same site. The city converted one building to a repair shop, and installed a hydraulic lift together with other necessary equipment, including two 4,000-gallon bulk-gasoline storage tanks having a recording meter on



Recreational facilities were not forgotten, as this recently constructed play-area shelter shows.

the pump that automatically stamps a delivery ticket to provide close control of all gasoline used.

The second building is now used for vehicle storage by all city departments. A 40x80-foot Parkersburg pre-engineered metal building erected adjacent to it satisfied the need for additional space.

Whereas all vehicles were formerly repaired by various private garages, this work is now done in the city's own shop and two mechanics handle this work.

Tire repairs and recap service were formerly purchased as needed. Now this work is done by contract on an annual-bid basis. Gasoline, lubricants and new tires are also purchased on an annual term supply contract let after competitive bidding.

Sewers

The matter of sewers is a big problem now under consideration. Alton's is an old system and about four years ago the planning commission and city engineers submitted to the council a short report on the condition of the sewers, recommending that a thorough survey be made. A federal advance planning loan was secured and the firms of Sheppard, Morgan & Schwaab of Alton and Crawford, Murphy & Tilly of Springfield, Ill. prepared a comprehensive report with recommendations. At present there are no sewage treatment facilities and the state has ordered Alton to provide primary treatment before discharge into the Mississippi River. Plans are now in progress to undertake a substantial sewer-construction program to be financed by revenue and general obligation bonds. This will probably necessitate a sewer service charge although general obligation bonds will be used to cover storm-sewer costs.

The city is considering purchase of the private water utility to make possible a joint utility venture with combined financing. The firms of Greeley and Hansen of Chicago and Sheppard, Morgan & Schwaab of Alton are preparing the appraisal and economic feasibility report on the purchase of the private water company.

Other items include setting up a sewer division under separate supervision to handle sewer cleaning and maintenance; continuing the policy of doing permanent paving by contract but using city forces to maintain and stabilize unimproved streets; and using meter maids for parking-meter enforcement.

The meter maids serve a threefold purpose: first to enforce the parking meters; second to act as hostesses or ambassadors; and third, to free qualified police officers for more appropriate duties. Three women employed in July 1958 were given an extensive two-week training program. This included a course in city geography such as routes through town, location of schools, hospitals and other institutions, bus routes and schedules, and similar information of use to visitors and local residents alike. They also were trained in meter repair and make all repairs which can be made on the street. They are provided with uniforms and badge and work 40 hours per week. Two maintenance men install, repair and make collections from the 1,300 Park-O-Meters. Meter income is used to finance off-street parking facilities.

That the aforementioned innovations and changes are paying off can be attested to by annexations recently completed, all on petition of those annexed. After many years of no expansion, the city has completed since July 1958, 16 annexations totaling over 600 acres, increasing the city's area to 8½ square miles and the population to an estimated 26,000. Of these, five tracts were improved with high-value industrial and commercial facilities, including the Alton works of Laclede Steel Company and the Alton Box Board Company. Valuation of the areas annexed since July 1958 approximates $10,000,000. Annexation also included one large residential area and one subdivision of relatively new, high-value homes.

On petition of more than 1,000 property owners in a large unincorporated area lying east of the city, the City Council has initiated an election to be held to determine the possible annexation of this area containing an estimated 10,000 persons. This same area, in an election last summer, turned down an incorporation proposal.

Space does not permit a full account of all the city's new or expanded activities, but this summary shows Alton's progress:

1. A new comprehensive plan is well under way.

2. The Building Officials' Conference of America Basic Building Code has been adopted and building code enforcement has been strengthened by the employment of a qualified chief building inspector.

3. A new land-subdivision ordinance has been prepared and submitted to the City Council.

4. A new zoning ordinance is virtually complete.

5. A workable program for urban renewal has been approved; approximately 150 units of public housing will be placed under construction by spring, including 50 units specially designed for the elderly. Application for approval of the first urban-renewal project has been submitted.

6. A modern accounting system providing sound budgetary control has been developed, using National Cash Register equipment.

7. All purchasing has been centralized with substantial savings resulting from competitive bidding.

8. The first codification of ordinances since the 1920s is well under way.

9. A fire-inspection program will be started shortly as will a new police-cadet training program.

Much has been accomplished in the brief span of two years—much more remains to be done. But, Alton is on the upgrade.

Traffic Progress Needs High Level Engineering

Highway program little relief to city congestion—"uniformity" is a rigid word—use whatever increases street capacity—traffic is the blood stream—serving the people's travel needs is the object

By T. T. WILEY
Commissioner of Traffic
City of New York

Congress recently adopted a law adding another cent to the federal gasoline tax to keep the Inter-Regional Highway system construction program on schedule. This involves over 40,000 miles of highway. The news stories and propaganda on this program emphasize the limited access design characteristics of the highways and the ability to make long trips uninterrupted by traffic signals, etc. This is fine, as far as it goes. But the inference is there that this program is the salvation of the nation's automotive transportation problems.

As traffic engineers, we know better than that. The great bulk of automotive travel is made up of short trips. The real centers of traffic congestion are the large metropolitan areas, with many smaller urban areas not far behind. Inter-regional travel is hardly more than a drop in the bucket compared to the trips to and from work, to and from shopping, and to and from the other activities in which people are engaged every day.

Except for the expressways in and around urban areas, the inter-regional system is not going to play much of a role in reducing traffic congestion for the many people who pay the gasoline taxes.

The crisis in highway transportation is not in inter-regional travel on "farm to market" roads. The crisis is in our rapidly growing urban and suburban areas where the "home to market" and "home to work" transportation requirements are not being met. And it is the people involved in this crisis who are paying a disproportionate share of gasoline taxes and who are getting little relief in return.

In brief, we have a highway program that is far out of perspective and which needs a complete overhauling really to provide service to the greatest number of the people.

There are three words in the lexicon of traffic and highway engineers that have taken on an aura almost Biblical in nature. These words are *warrants, uniformity* and *standards.* These words suggest several others to me, such as conformity, stabilization, mediocrity, excuses, and others. But one word they do not suggest, because it is their antithesis. That word is *progress.*

Now, I am not saying that warrants, standards, and uniformity should be abandoned. They serve useful functions—in the right perspective. But we do seem to have a propensity to set down a specific warrant for doing this or that, such as warrants for signals, warrants for STOP signs, warrants for one-way streets, etc., etc. Pretty soon professional training, experience, and judgment can be discarded. All that we will need is a good trade school teacher to teach us how to read the manual and the tapes from traffic counters and we will be set.

Proper Perspective

Let's put these so-called warrants in proper perspective and recognize that they are only guides. The real warrants for action are set forth in our definition of traffic engineering whose objectives are "safe, convenient, and economical transportation of persons and goods." If what is proposed meets these objectives, then, and only then, is it warranted. It takes professional judgment to make that determination.

The development of manuals for uniform traffic control devices has prevented chaos and brought a high degree of order into the design and use of such devices. There has been a constant searching and a departure from uniformity by engineers striving for improvement and progress. That is the purpose of research for which we justly raise a cry of "More, more."

What is the basic purpose of uniformity—to standardize on colors, shapes of signs, proportion of arrows, etc.? Of course not. The purpose of uniformity is to provide instantaneous, complete understanding on the part of the motorists and pedestrians with no cause for confusion. We want rapidity and uniformity of animate reaction, which is something different from uniformity in inanimate standards. Viewed in this perspective, neither blind adherence to uniformity, which prevents progress, nor rash, unreasoned departure from it can be regarded as the mark of professional action.

This same line of thought applies to design and other standards. If a standard is 20 years old, it should be presumed to be obsolete. If 10 years old, it certainly should be fully reviewed. Even if only 5 years old it may be ready for modification. Blind adherence to standards is the mark of mental laziness and results in mediocrity. Let's not let standards block the way to progress.

If there is a secret to effective work in our profession, it is in knowing when to depart from the normal, the warrant, the uniform, or the standard. It is the ability to distinguish between the unusual and the routine and to apply professional judgment to problems to the fullest degree, guided but not bound by warrants, uniformity, and standards. Let's keep those three little words in perspective.

Economy or Efficiency?

As engineers, we are taught to be economical. But, just what does this mean? It doesn't mean cheap, but rather getting our money's worth. In designing and constructing modern highways, large sums

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EDITOR'S NOTE: This article is based on an address given by Mr. Wiley before the annual convention of the Institute of Traffic Engineers at the Hotel Commodore, New York City, September 14, 1959.

are spent to provide stabilized subgrades, metaled shoulders, drainage structures, and other features to provide longer life and easier maintenance. But, the purpose of a highway is not to provide something with long life that is easy to maintain. It is to provide a roadway over which traffic can operate safely, efficiently, and economically. Why, then, do we have to quibble so much over the cost of traffic control devices essential to getting the most effective service out of the highway? If a 10-foot paved shoulder is needed, it is provided in spite of the added cost. By the same token, if a sign bridge is needed at a critical point, we should not settle for the comparatively inexpensive sign at the edge of the shoulder. This may be more important in getting the most value from the highway than a continuous wide shoulder. Or if traffic-actuated signals will move more traffic with fewer stops and delays, why settle for something less just because it is cheaper? How can we get the maximum value from the streets if we don't operate them at maximum efficiency? Let's get the costs of operating the highway so as to provide the maximum service in perspective with the costs of building and maintaining it.

Good Engineering Practice

Good engineering practice calls for a field-check of highway plans to pick up oversights or blunders related to drainage, grade, and other elements of design. But, are the plans field-checked by traffic engineers? Can children cross the highway to get to school? Can residents get to a shopping area? Is the exit ramp going to catch the motorist by surprise due to topography? Is the highway to be effectively signed and are the proper traffic control and operation features provided?

If we are to grow in esteem, we are going to have to overcome our inferiority complex represented by the idea that we can't do anything in the field of traffic regulation and control unless approved by a city council. Is establishment of a parking regulation, or creation of a one-way street, or installation of a stop sign, or other traffic control step, a matter for professional judgment, legislation, or debate? If we maintain that these matters are of professional nature, then why leave the decision to a city council or debate it before a commission or committee where it can be delayed endlessly or vetoed? A few of us have the power to put our decisions into effect; most do not. In what perspective do we put our responsibility for traffic control? Other groups whose activities affect us also have difficulties in keeping their objectives in perspective. Consider the automobile manufacturers. In the past several years, their sales promotion, styling and designs ignored important factors of economy and safety.

The rapid growth in popularity and sales of foreign cars and so-called small domestic cars is striking evidence that the over-powered, over-sized, over-expensive cars were not what the public really wanted. Thank goodness the senseless horsepower race appears to be over. We are now starting to hear again about economy of operation. But, we have lost irretrievable ground in many respects.

The lowering of the height of vehicles and of the eye-level of the driver has added substantially to the safe sight distances required over vertical curves. No-passing zones must be lengthened. Many street intersections where corner visibility was satisfactory are now more dangerous. Higher fins and lower seats have negated the advantage of more glass area. The greater lengths and widths of vehicles have made many parking garages obsolete and have added hundreds of millions of dollars to the costs of providing much needed parking facilities in this nation. Home driveways and garages have been made unusable.

The automobile industry has produced the finest, most expensive, most wasteful, mechanical monsters in the history of highway transportation. But, the industry let advertising and sales gimmicks distort its perspective of the real needs of the public vehicle compatible with the objectives of safe, convenient, economic transportation. Motor vehicle administrators, politicians, and others have spoken out in some fashion on this broad issue. But we, the traffic engineers, have buried our heads in the sand.

Amateur Experts

Because this business of ours happens to be one that affects just about everybody, we have many people injecting themselves and their ideas into the picture. How many times do we hear that our cities are being strangled to death by traffic congestion?

Traffic is the transportation of persons and goods. The movement of persons and goods is the life blood of the city. Take traffic away and the city dies. These alarmists do not recognize that traffic congestion is a symptom—a result—not a cause of difficulties. The office building, the stores, the industries, and the other establishments where people work, do business, shop, eat, and otherwise enjoy themselves are the generators of traffic. Remove them and there will be no traffic congestion—and no city.

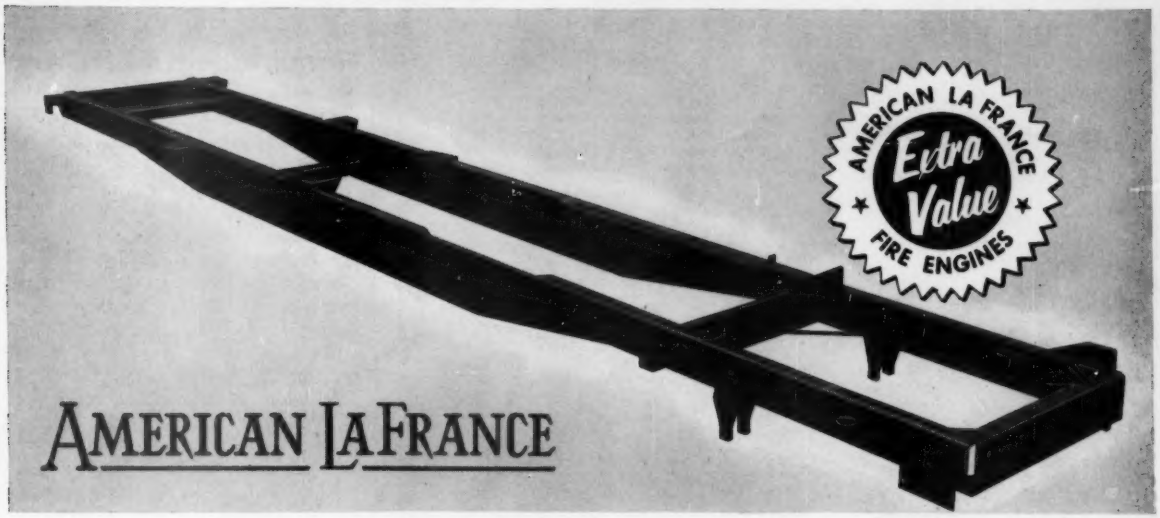
If cities are to thrive, they must accommodate traffic—not do away with it. That is why traffic engineers must do everything possible to get more utility from existing streets and why additional facilities must be provided for the safe, convenient, economic transportation of persons and goods.

And, this is as good a time as any to put off-street parking into perspective. The act of parking is just as much a part of transportation as movement itself. Except for joy riding, movement is only a means to an end. It serves no purpose unless terminal facilities are available.

Now there is a wave of proposals to close Main Streets across the country and turn them into pedestrian malls. Some of these propagandists talk of serving the people instead of vehicles.

Now, it has always been my impression that it is people who are in these vehicles and that these vehicles are serving the people. So, let's not put up with that nonsense. The propaganda speaks of bringing in more business. Just how this is accomplished is not clear to me. Can you imagine a housewife saying, "I am going downtown to shop because Main Street has been closed to traffic. They've planted flowers and erected banners so it must be real nice." Now, traffic engineers know from actual surveys that what she really would say is, "I'm going downtown to shop because I can get there easily, there will be a good parking space available, and I can find what I want at a good price." Such schemes must be kept in proper perspective and appraised as to real worth.

Finally, our ultimate concern must always be the public. All of our activities must be viewed in the broad perspective of the needs of the people—young and old, rich and poor, luxury car owner and bus rider, taxicab and truck driver.



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The 900 Series pumper chassis frame incorporates important improvements to provide more strength, safety and rigidity. The greater stiffness (section modulus 10.15) means less deflection with full load on the roughest streets and less "working" of the sheet metal and body enclosures.

The frame side rail section is "fish belly" type with 10½ inch depth between the front and rear springs. All cross members and stiffening gussets are electric welded to provide a maximum of torsional strength and retain correct alignment under all operating conditions.

The "unitized" frame construction is one of the many American LaFrance Extra Value features. The design improvements include a deeper front cross member of "wrap around" construction at the front end of the frame side rails. Each of these Extra Value features are standard construction with American LaFrance.

The frame material is carbon steel (.17 – .25 carbon) without heat treatment. Heat treatment does not increase or affect the frame stiffness, only permits greater deflection of a lighter section. The greater frame section provides more stiffness and rigidity with a big factor of safety for full loading.

The SPARTAN, 1000 g.p.m. pumper

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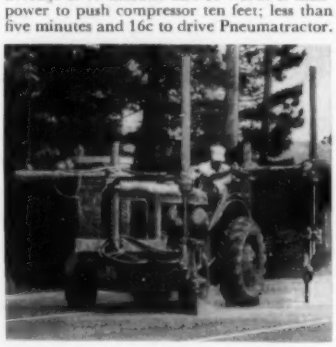

There's no end to the things Pneumatractor can do. Here, it drills holes in pavement for raising or undersealing.

Sewer Pipe and Fitting Requirements to Grow

Almost two billion feet of sewer pipe and fittings will be required for new construction, maintenance and repair between now and 1975 in order to provide adequate public sewerage facilities by that year, according to the Water and Sewerage Industry and Utilities Division, Business and Defense Services Administration, U. S. Department of Commerce.

The estimated requirements do not include sewer pipe, which is used for transporting industrial fluids other than liquid wastes; house connections to street mains; or culverts, drainage pipe, and storm sewers included in street paving construction, for which statistics are not available.

Principal Types

A report by the division covers the three principal types of pipe used for sanitary- and storm-sewerage collection and disposal: vitrified clay, concrete, and asbestos-cement. For convenient correlation with end use the pipe requirements are grouped into three size classes: 8 to 12 inches; 15 to 24 inches, and larger.

The principal segments of sanitary- and storm-sewer construction involving sewer pipe are extensions of existing systems to new areas; general improvements to existing systems; construction of entirely new systems; and miscellaneous industrial, military, and other federal government construction.

In its report, the division emphasizes the greater-than-average need for sewerage facilities in recent years and also the accumulated backlog of needed facilities and improvements created during World War II when construction was held to a minimum.

Basis for Estimates

The division's estimates of the projected pipe requirements are based on adequate maintenance and repair, needed system improvements, and construction of new facilities to keep pace with normal growth of sewerage services to satisfy adequately the nation's needs by the end of 1975.

The report, titled "Sewerage Utilities, Sewer Pipe Requirements for Mains, 1920-1958-1975" is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. It is priced at 5 cents.

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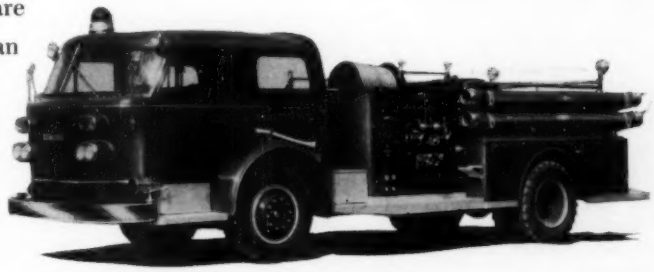


Front mounted shock absorbers have long been recognized as essential to maintain steering control. Rear mounted shock absorbers not only add to the control, but create increased road stability plus greater safety for the men and equipment. Specify this Extra Value feature for greater safety and ride control.

AMERICAN LAFRANCE

A DIVISION OF STERLING PRECISION CORPORATION
ELMIRA, N.Y., U.S.A.

LaFrance Export Corporation Elmira, N. Y.
LaFrance Fire Engine and Foamite Limited
Toronto 9, Ontario, Canada

An Urban County's Traffic and Roads

By DANIEL J. MURRAY
Highway Maintenance Superintendent
Essex County Highway Department
Livingston, New Jersey

The Essex County (New Jersey) Traffic Division is a subsidiary of the County Highway Department and functions directly under the Superintendent of Highways who is also the Deputy Supervisor of Roads. The Traffic Division consists of three departments:

Traffic Signal, which is sub-divided into Installation and Maintenance;

Sign, which erects and maintains;

Street Painting, which maintains all cross-walks, center lines and lane lines.

The Traffic Signal Department, as of this date, maintains 314 signalized intersections. This figure is annually increased by an average of eight as intersection traffic problems continue to demand signalized control. The county also maintains a few signalized intersections for municipalities.

Paralleling this program of new installations which call for modern equipment is a schedule of modernization. This consists of annually revamping a predetermined number of signalized intersections that do not measure up to the present day standards established by the County of Essex.

While on the subject of installations, all county-designed signalizations are first submitted to the New Jersey Motor Vehicle Traffic Bureau for approval. This is conducive to a uniform state-wide set of standards with which Essex County agrees.

Once the County and State Traffic Divisions have arrived at an harmonious analysis, a master print is prepared and sent to the County Operations Division. Here the master print is broken down by the engineering clerk and material and work orders are issued by the operations supervisor to the respective departments involved.

The chart is a county traffic division functional flow chart of a master print as it is processed by the engineering clerk. (See illustration at right.)

The methods employed to gain traffic control at any given intersection vary with local conditions. This results in different electro-mechanical and electronic controllers for each location or system of traffic control. In use and maintained by this division are the following types:

Fixed time (1-dial, 2-dial and 3-dial) controllers functioning both in isolation and under supervision of a master control center.

Semi-vehicle and full vehicle actuated electronic dispatchers both interconnected and non-interconnected.

Full vehicle actuated volume density electronic dispatchers.

Electro-mechanical and electronic pedestrian demand controllers.

Radar, magnetic and pressure sensitive vehicle detectors and counters, and phase relation "PR" electronic master control systems.

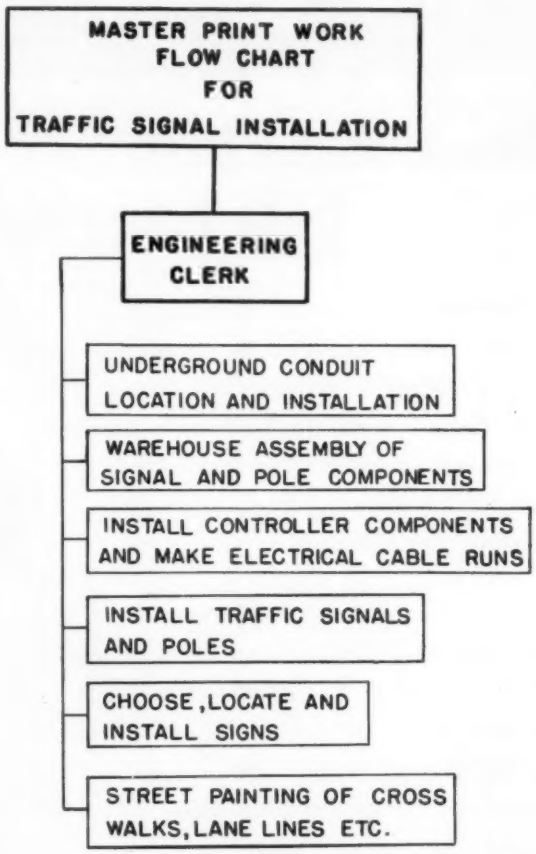
From its inception in 1927 the traffic division maintained signalized intersections which had been installed by or under previous authorities. The type of control mechanism was electro-mechanical in the simplest form as compared with the above mentioned types of control systems. Today, and since 1927, all traffic signal installations and modernizations are installed and maintained by traffic division personnel. A vital element of their maintenance is the 7,890 traffic signal lamps burning. Two-way radio equipped ladder trucks have made this phase of maintenance faster, easier and less expensive.

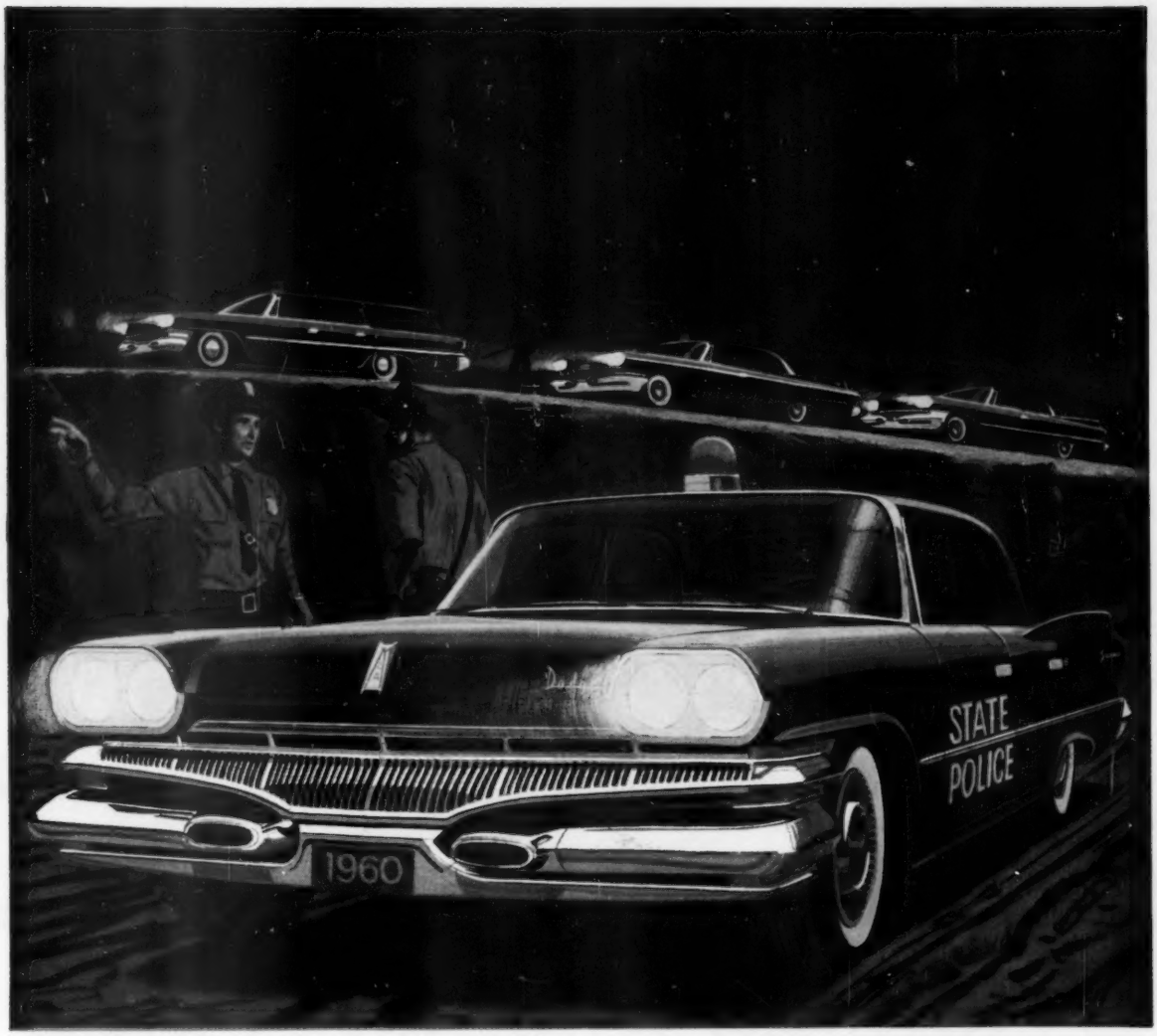
The county has a traffic engineer and an assistant traffic engineer. Traffic Engineer Clarence Rusby determines the need for traffic control or regulatory devices and designs and furnishes the plans to the traffic division.

The traffic engineer records all accidents along county highways and particularly the records of repetitive accidents. He makes daily continuing surveys of traffic volumes and movements. His files on traffic volumes, accident statistics and traffic signal timing are in almost daily use by municipal departments and county courts. When studies are to be made by consulting engineers and architects for new business ventures, they consult his files.

Under provisions of the Motor Vehicle Act the

(Continued on page 109)


MASTER PRINT WORK FLOW CHART FOR TRAFFIC SIGNAL INSTALLATION
ENGINEERING CLERK
UNDERGROUND CONDUIT LOCATION AND INSTALLATION
WAREHOUSE ASSEMBLY OF SIGNAL AND POLE COMPONENTS
INSTALL CONTROLLER COMPONENTS AND MAKE ELECTRICAL CABLE RUNS
INSTALL TRAFFIC SIGNALS AND POLES
CHOOSE, LOCATE AND INSTALL SIGNS
STREET PAINTING OF CROSS WALKS, LANE LINES ETC.



Front and center: Dodge Dart 4-Door Police Pursuit. Left to right: Dodge Dart Station Wagon, '60 Dodge 2-Door and Dodge Dart 2-Door Police Pursuits.

New Police Pursuits by DODGE Put You in Command!

ON TURNPIKE, CITY OR SUBURBAN STREET

Pursuit, patrol, whatever the action—new Police Pursuits by Dodge respond like no police specials before! Here are four models of two distinctly separate cars: all-new Dodge Dart and the authoritative new '60 Dodge. Mighty power, sure economical operation, swift maneuverability, added endurance come from 1960's greatest automotive advances: Unibody construction, "Economy Slant" 6-cylinder design, Ram Induction V-8 performance, many more! Add to these heavy-duty features proven in action, and you have police cars that truly command respect, truly deserve it. They're loaded with toughness and muscle to make you master of the most difficult law enforcement situations! For economy, dependability, performance, safety and driver comfort—here are police cars beyond compare.

DODGE DART and '60 DODGE Police Pursuits

SWIFT—Five authoritative new engines, plus cat-quick cornering and sure-footed roadability, make new Dodge Dart

POWER-PACKED, AGILE,

Performance to put you on top of every police job with ease! Extra durability to keep you there day in, day out! Dodge gives you both, in 1960 more than ever before!

Here's spirited, dependable engine power that discourages law violations before they happen, that gives every officer added pride and confidence! Here's fast, predictable handling plus driver ease and comfort that let officers work more efficiently with less fatigue! And above all, here is tough, dependable construction that takes the hardest service right in stride.

Take your choice of two great new cars in four models! Pick the light weight and responsiveness of the compact, all-new Dodge Dart and its 118" wheelbase. Or choose the ruggedness and unmatched high-speed handling of the big, brawny 122" wheelbase '60 Dodge.

Police Pursuits by Dodge for 1960 feature the dramatically greater comfort, strength and safety of revolutionary new Unibody construction. They offer the lively yet economical performance of the new Economy Slant "6", most modern 6-cylinder engine in the industry. They offer the breath-taking, all-out power of the 383 cu. in. Special Police Pursuit Dodge V-8, famed for its selection by the California and Missouri State Highway Patrols. And as standard equipment you get famed Torsion-Aire Suspension and heavy-duty Total-Contact Brakes, plus heavy-duty clutch, heavy-duty prop shaft, heavy-duty generator and battery and many more special features.

Only Police Pursuits by Dodge give you so much that's truly valuable in law enforcement work!

DODGE DART and

and '60 Dodge Police Pursuits more than the match for every highway challenge.

Exceptional New Economy or HP/Weight Ratios Up to 1 to 12

A radically new 6-cylinder engine, 4 great new V-8's and 5 manual and fully automatic transmissions allow you to choose the power team that exactly meets your needs. Engines start with the new Economy Slant "6", range through various degrees of economy and power to the new D-500 Ram Induction 383 cu. in. V-8 (one h.p. per 12 lbs. in the new '60 Dodge 2-Door Police Pursuit). Transmissions include three automatics: PowerFlite, TorqueFlite and new TorqueFlite Six, plus heavy-duty or extra-heavy-duty T-85 manual transmissions, both with heavy-duty clutch.

Famed Torsion-Aire Ride

Torsion bar front suspension, direct-acting Oriflow shock absorbers and outboard-mounted rear leaf springs make up Torsion-Aire, admittedly the finest suspension in the industry. Officers enjoy a ride as smooth as silk. Even more important, they get complete control of a car that's agile and able.

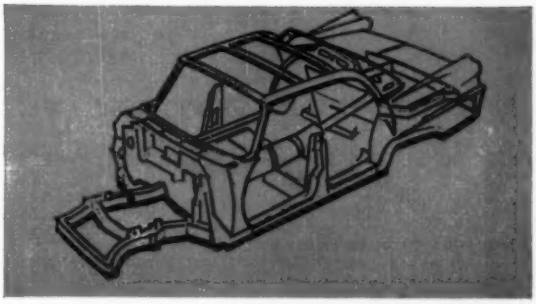
Total-Contact Brakes

To match the "go power" of its great new engines, Dodge features the husky stopping power of Total-Contact Brakes. Their unique design puts your *whole* brake lining to work, not just part of it. You get the safety of quick, straightline stops, time after time after time, even in the foulest weather.

BUILT TO TAKE IT!

REVOLUTIONARY NEW UNIBODY CONSTRUCTION!

New comfort, safety, strength and durability come to Dodge with this new advance in body construction. Unibody design is one piece, does away with conventional frame construction. You drive and ride surrounded by a "one-piece fortress of steel" that gives you maximum roominess, maximum protection, faster, easier entrance and exit, more relaxed seating. Unibody isolates road noise and vibration, all but eliminates squeaks and rattles and helps give new Police Pursuits by Dodge unrivaled road and handling qualities. What's more, 11 spray and deep-dip treatments make each Unibody virtually rustproof!



'60 DODGE Police Pursuits

INDUSTRY'S BIGGEST MODEL AND EQUIPMENT SELECTION LETS YOU FILL YOUR NEEDS EXACTLY!

2 cars • 2 wheelbases • 4 models • 5 engines • 5 transmissions

DODGE DART

118″ wheelbase—light, compact, nimble!

Dodge Dart 2-Door Police Pursuit (118″ wheelbase)

Dodge Dart 4-Door Police Pursuit (118″ wheelbase)

Dodge Dart Station Wagon Police Pursuit (122″ wheelbase)

'60 DODGE

122″ wheelbase—big, brawny, powerful!

'60 Dodge 2-Door Police Pursuit

No other police cars on the road give you such opportunity to fill your needs exactly! Equip your "finest" with the "finest." Contact your nearest Dodge Dealer.

Look at These Standard Features!

Revolutionary New Unibody Construction • Famed Torsion-Aire Ride • Total-Contact Brakes • New Free-Flight Power Engine Mounting • Heavy-Duty Clutch • 14″ x 5K Safety-Rim Wheels • Front and Rear Arm Rests • Left-Hand Sun Visors • Replaceable Element Oil Filter • Electric Windshield Wipers.

This Basic Police Pursuit Equipment Is Available at Low Package Cost!

30-amp. Heavy-Duty Low Cut-in Generator with Double Ball Bearings. Charges Police Pursuit batteries fast, assures you that you will always have enough current to operate all accessories and special equipment.

70-amp.-hour Heavy-Duty Battery and Heat Shield. Big six-cell 12-volt battery takes rigorous service, meets all the extra requirements of heavy-duty equipment.

Heavy-Duty 11″ x 2½″ Brakes, front and rear. Rugged extra-large Total-Contact Brakes give police officers continuously dependable, non-fading stops even in unusually demanding stop-and-go service.

Heavy-Duty 8-Cylinder Hi-Speed Prop Shaft. Equips Dodge Police Pursuits with a drive train capable of withstanding exceptionally demanding use.

Highly Recommended Police Pursuit Options!

Heavy-Duty Torsion Bars and Springs • Heavy-Duty Shocks • Sway Bar • Extra-Heavy-Duty 12″ x 2½″ Brakes • Police Calibrated Speedometer.

Additional Police Pursuit Options

Map Light • Heavy-Duty Seat Springs, front and rear (standard on '60 Dodge) • Kickboard (standard on '60 Dodge) • Foam Rubber Front and/or Rear Seats • Variable-Speed Electric Windshield Wipers • High-Output Generator (50-amp. Bosch and 40-amp. Autolite) • Heavy-Duty Alternator, Leece Neville 60-amp. • Right-Hand Sun Visor with Vinyl Trim Option • Vinyl Trim (excluding right sun visor) • Wiring for Roof Flasher • 8.00 x 14″ Tires with 14″ x 5½ K Wheels (standard on Dodge Dart Station Wagon Police Pursuit and '60 Dodge 2-Door Police Pursuit) • 8.00 x 14″ Tires with 14″ x 6K Wheels • 6.70 x 15″ Tires and 5K Wheels (except on Dodge Dart Station Wagon and '60 Dodge Police Pursuit) • 7.10 x 15″ Tires with 5½ K Wheels • Hi-Capacity Radiator • 7-Blade Fan and Shroud (except on 6-cylinder engine) • Radio Suppression Package.

Goodyear 3-T Nylon "Police Special" 8.00 x 14″ Tires

Special construction for extra durability and extra performance. Nylon cords triple-tempered for maximum strength and resiliency. Features "Low Angle" ply construction, "Grip-Seal" puncture protection, balanced traction tread and cushioned riding comfort.

ENGINE SPECIFICATIONS—POLICE PURSUITS BY DODGE FOR 1960

MOST MODERN 6 IN THE INDUSTRY!

Economy Slant "6"—available only on Dodge Dart

Type OHV, Manifold semi-ram type, Cylinders 6, Taxable horsepower 27.74, Bore 3.40 inches, Stroke 4.13 inches, Displacement 225 cu. inches, Compression ratio 8.5 to 1, Carburetor single downdraft, Torque 215 lb.-ft. at 2800 r.p.m., Horsepower 145 at 4000 r.p.m.

Red Ram V-8—available only on Dodge Dart

Type OHV 90-degree V-8, Cylinders 8, Taxable horsepower 48.9, Bore 3.91 inches, Stroke 3.31 inches, Displacement 318 cu. inches, Compression ratio 9.0 to 1, Carburetor dual downdraft, Torque 340 lb.-ft. at 2400 r.p.m., Horsepower 230 at 4400 r.p.m.

Super Red Ram V-8

Type OHV 90-degree V-8, Cylinders 8, Taxable horsepower 54.3, Bore 4.12 inches, Stroke 3.38 inches, Displacement 361 cu. inches, Compression ratio 10 to 1, Carburetor dual downdraft, Torque 390 lb.-ft. at 2400 r.p.m., Horsepower 295 at 4600 r.p.m.

Special Police Pursuit 383 cu. in. V-8

Type OHV 90-degree V-8, Cylinders 8, Taxable horsepower 57.8, Bore 4.25 inches, Stroke 3.38 inches, Displacement 383 cu. inches, Compression ratio 10 to 1, Carburetor 4-barrel, Torque 425 lb.-ft. at 2800 r.p.m., Horsepower 325 at 4600 r.p.m.

D-500 Ram Induction 383 cu. in. V-8

Type OHV 90-degree V-8, Manifold ram induction type, Cylinders 8, Taxable horsepower 57.8, Bore 4.25 inches, Stroke 3.38 inches, Displacement 383 cu. inches, Compression ratio 10 to 1, Carburetor dual 4-barrel, Torque 460 lb.-ft. at 2800 r.p.m., Horsepower 330 at 4800 r.p.m.

The policy of Dodge Division of Chrysler Corporation is one of continual improvement in design and manufacture wherever possible to assure a still finer car. Hence, specifications, equipment and prices are subject to change without notice.

The intersection of Central and South Munn Aves., East Orange, N. J.

The intersection of Central and South Munn Avenues, East Orange, N. J. is on top of a hill which falls away rapidly from either side of South Munn Avenue. To give the necessary sight distance a truss 20-foot trombone-style arm was installed. Previosuly, many motorists ran through the red light as they approached the intersection from the same angle as that from which this picture was taken. This has been eliminated.

At Park Ave. and Washington St., East Orange, N. J., the streets intersect at a 120-degree angle. This fact together with a ten-foot dividing island on Park Ave. created the need for the traffic signals shown in this picture. Park Ave. is an east-west county road carrying large volumes of traffic in and out of the City of Newark. Two insurance company branches and a branch of the New Jersey Bell Telephone Company add heavy pedestrian traffic and vehicular traffic to this location. The aluminum traffic standards were supplied by Pfaff and Kendall, 84 Foundry St., Newark 5, N. J.

Traffic signals at Park Ave. and Washington St., East Orange, N. J.

(Continued from page 104)

legal speed limits as established for different areas may be increased or decreased to permit more realistic enforcement provided speed surveys are made and submitted to the Motor Vehicle Department for approval of any change. Speed zoning is determined by the county traffic engineer, with the aid of a radar speedmeter owned by the department. The facilities of the department are always available to any municipality in Essex County. The cities of East Orange and Newark and the Towns of Montclair and Irvington maintain their own traffic departments.

Municipal Requests

Requests from municipal authorities for the installation of traffic control devices at an intersection with a county highway are immediately followed by complete traffic surveys at the points in question. If, in the judgment of the traffic engineer, traffic signalization is needed, approval of the Board of Chosen Freeholders is recommended, application for permit to install is sent to the State Bureau of Traffic Safety, and the municipality so advised. When, as, and if approval for the installation is received, the county enters into a cost-sharing agreement with the municipality, if a municipal street is involved. For the original installation, at a four-corner intersection, the county and the municipality share equally in the cost of installation and from then on the county pays 100% of the cost of maintenance, including the cost of electrical service.

Essex County and its Board of Chosen Freeholders are firmly of the opinion that traffic engineering is an important function of county government and that the cost for such services is justified because of the benefits that accrue to the community.

The Essex County Highway Department division of maintenance services 200 miles of roads interlacing

21 municipalities. Each department of the division of maintenance is under permanent supervisory control but working personnel and equipment alternate and fluctuate as the work load varies due to seasonal and emergency demands.

A typical example is the road restoration crew which, when its quota is filled, moves in and performs all the traffic signal underground construction work. A capsule description of each department including its special equipment, if any, and a few pertinent statistics are given below.

Catch Basin Maintenance

It maintains 5,469 catch basins. The 6,790 cleanings removed 2,950 cubic yards of dirt. Inspections were made of 2,926 basins. The special equipment for this work consists of two "Silent Hoists" mounted on GMC 2-ton truck chassis with cabs.

Sweeping

Our road sweeping motorized crews swept 13,496 curb miles removing 4,347 cubic yards of dirt. Hand crews picked up 1569 yards of sweepings. Our special equipment in this department consists of five Mobil dual control sweepers and for seasonal leaf collecting we use our skid-mounted Obeco Tornado street cleaners and leaf collector and one skid-mounted American Vacuum Leaf Loader.

Masonry Maintenance

There are 2,000 bridges and culverts assigned to highway maintenance for servicing. Since the major portion of this repair is brick, stone and reinforced concrete, responsibility is allocated to the masonry section. Also, all construction, alterations and repairs, exclusive of contract work, on the 8,419 catch basins and manholes and on storm sewer drainage are performed by this section along with all damaged curbing and sidewalk repairs.

Our carpentry shop makes bridge scaffolding for the masons when pointing-up bridges and trench bracing for the sewer gang when they "go deep." All wood forms for the many poured concrete requirements are made in the shop. There are constant requests for wood forms for fence posts, safety rail posts and intricate bridge balustrades.

As routine, the shop supplies all standard wood forms required by the traffic signal installation crews and the construction and periodic repair of all county owned, field placed, sand boxes, and, last but not least, all plant and office alterations including civil defense and disaster control headquarters.

Mowing on the 200 miles of county roads is done by two tractor mowers. Two "passes" or "times around" keep weeds and grass down.

Essex County weather forecasting service is by contract. When an alert is received there is simultaneous action on three fronts:

Highway personnel are contacted and participate as needed.

County institutions are alerted.

State Police are notified and requested to alert all Essex County police departments by telephone.

During 1958, the snowfall in Essex County measured 47.4" as compared with an average of 24" as recorded at Newark Airport. Listed below are a few pertinent statistics:

Snow fence erected, lineal feet	7,600
Snow plows mounted on county equipment	26
Spreaders on county equipment	25
Snow plows mounted on contractors' equipment	69
Spreaders on contractors' equipment	20
Total number of plow routes	31
Total number of curb miles to one round of plowing—approximately	453
Salt received in bags, tons	1,790
Ashes purchased, cubic yards	4,021
Solvay purchased, tons	35
Sand boxes set out	49
Stock piles set out	475

Herbert A. Hanfer is Assistant County Engineer. Erwin Gerber is Chairman of Public Works.

Truck equipment used by the Essex County Highway Department for traffic signal erection and maintenance.

The Essex County Highway Department uses a variety of truck equipment for traffic signal erection and maintenance. Rear row, left to right: rack body cable truck; hydraulic tower truck; flat body sign truck; aerial ladder truck; four crosswalk paint machines; Wald single line spray machine; Van body paint truck with hydraulic tail gate. Front row, left to right: two aerial ladder trucks; express body truck equipped with skids for transporting M-B 2-gun spray machine; two express body paint trucks (used with crosswalk paint machines).

This meter stops revenue-robbers

Rockwell-built Dual single automatic meters are the *only* automatic meters with entire mechanism enclosed and protected by rugged inner case.

Many parking meters can be tripped or jammed easily with a wide range of objects . . . every time this happens it means lost revenue and mounting repair costs for some community. This can't happen to Rockwell-built Dual Parking meters because the rugged stainless steel coin passage is closed as the clock is engaged, making it impossible to get at the timing mechanism with popsicle sticks, paper clips or other objects. This *proven* tamper-proof design is just one more example of the built-in quality that pays profitable dividends year after year to communities using Rockwell-built Dual Parking meters.

Whatever your parking meter needs, there are Rockwell M-1 Manuals, Dubl-Duals and Automatics to help solve your metered traffic control problems. Why not have a Rockwell parking meter specialist call on you soon? He represents 25 years of experience in the profitable solution of parking meter problems. Dual Parking Meter Company, Subsidiary of Rockwell Manufacturing Company, Pittsburgh 8, Pa.

DUAL PARKING METERS
another fine product by
ROCKWELL

SEND COUPON FOR FREE DETAILS

Rockwell Manufacturing Company
Pittsburgh 8, Pa.

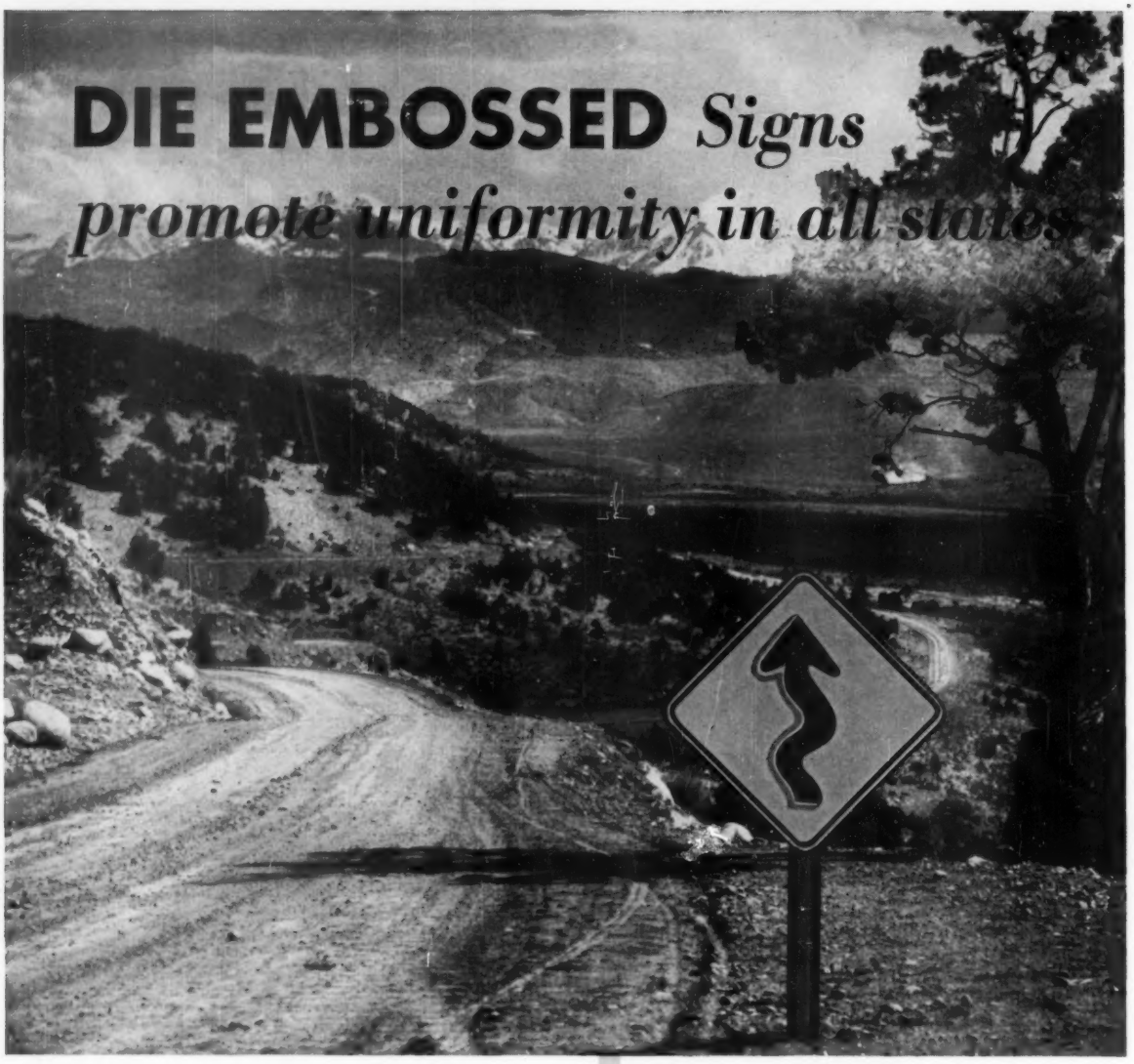
☐ Please send details on the Dual Parking Meter line.

☐ Please have a Rockwell field engineer call.

Name: _____ Title: _____

Address: _____

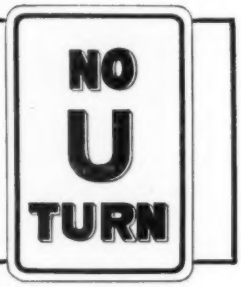
City: _____ Zone: _____ State: _____



In state after state, uniformity in city and highway traffic signs is promoted and maintained by the manufacturers of DIE EMBOSSED signs. Imagine the hodge-podge if every state, every community, selected their own size, color, shape and wordings. Stick with uniform DIE EMBOSSED signs from reputable manufacturers.

Die Embossed Signs *are your* Best Buy

Sharply embossed letters and borders add rigidity, prevent specular reflection, increase angle visibility, reduce vandalism. Baked enamel finish is highly rust resistant . . . adds extra years of life to both plain and reflectorized signs.



- S. G. ADAMS COMPANY, ST. LOUIS 3, MO.
- GOPHER STAMP & DIE CO., ST. PAUL, MINN.
- GRIMM STAMP & BADGE CO., ST. LOUIS, MO.
- LYLE SIGNS, INC., MINNEAPOLIS, MINN.
- MIRO-FLEX CO., INC., WICHITA, KANSAS
- N.S.E. SIGNS & STAMPINGS, B'HAM, ALA.

Thirty-Two States Use Edge Markings

The first state to use right shoulder lines and edge markings began the practice in 1935; since then 31 other states have followed suit, according to a survey of state highway practices supplied by the Cataphote Corp., Toledo, Ohio and Jackson, Miss. The states started using the lines as follows: 1935 one; 1946 two; 1948 one; 1953 one; 1954 three; 1955 eight; 1956 eight; 1957 four; 1958 four. Of the 32 states using these lines, seven report a reduction in accidents because of them.

Increasing Use

Below are shown miles of edge markings and right shoulder lines placed by the state highway departments. In eight states, at least, the proportion of line mileage to state highway mileage is large and generally growing:

	Miles of Edge Lines in		*Miles of State*
	1958	*1959*	*Highway in 1956*
Florida	1,000	2,500	11,984
Illinois	2,800	3,300	10,570
Maryland	4,100	(*)	4,444
New Jersey	3,071	3,071	2,028
Ohio	13,623	14,502	15,824
Rhode Island	300	300	712
Utah	1,691	1,800	4,900
Wisconsin	100	2,000	10,202

Remaining states using edge lines and the mileages:

	Miles of Edge Lines in	
	1958	*1959*
Alabama	1,000	1,200
Arizona	73	73
Colorado	90	(*)
Connecticut	1,500	(*)
Idaho	30	(*)
Kansas	186	200
Kentucky	experimental	
Maine	10	10
Massachusetts	250	(*)
Michigan	500	1,100
Minnesota	800	1,300
Missouri	65	65
Montana	10	60
New Hampshire	75	100
New Mexico	40	40
North Carolina	2,403	3,500
North Dakota	5	5
Oregon	600	800
Pennsylvania	40	40
South Carolina	100	100
Vermont	special locations	
Virginia	138	138
Washington	11	11
Puerto Rico	3	3

(*) Information not available.

Principal advantages are help at night, in bad weather and on mountain roads, better guidance for drivers, and safety and assurance to the driving public. Two states find a reduction in shoulder maintenance.

One state says the lines must be swept frequently. Other objections are that the lines are useless in snow and that they are too costly. Sixteen state highway departments report costs per mile for both lines ranging from $70 to $150, as follows:

	Costs	*No. of States*
Less than	$ 70	2
	70- 79	2
	80- 89	0
	90- 99	2
	100-109	2
	110-119	1
	120-129	2
	130-139	1
	140-149	2
More than	150	2

The practice is to reflectorize these lines. All mileage is reflectorized in 28 states; 91% in one state; 80% in one state; and 69% in one state. Another company interested in edge lines, Flex-O-Lite Manufacturing Corp., St. Louis, Mo., says in this connection: "It is considered important to use some drop-on beads for immediate effectiveness. As you know, the edge line stripe gets very little wear as compared with the center line and as a result, if pre-mix is used, it may be a long time before the paint wears off the surface of the beads for the line to become effective. It is important that the program be a drop-on application or a combination of pre-mix and drop-on.

"Because the edge line is not traveled on as much as the center line, it is believed that it should last two years or more. The condition of the pavement at the time of application, however, might be a factor here. On new pavement where curing compounds are used, which at times have a waxed base, the surface has poor paint adhesion qualities."

Opinion regarding the use of edge lines is generally favorable. One state foresees the eventual use of these lines on all state highways, another on all expressways. Other states say they will use the lines on interstate roads only, on all 2-lane roads, or on all 14-foot lanes. Of five states not using them three states say that the reason is cost; one state, that they are not needed; one state, that it uses another method.

U. S. Training for British Traffic Engineers

The heavy traffic on British roads, with hold-ups on main roads up to ten miles in length, has forced the Minister of Transport to agree to the appointment of traffic engineers all over the country.

As a start, two members of his staff, plus men from the London County Council and the city of Birmingham, will take the eight-month course in traffic engineering at Yale University.

Minister of Transport Watkinson said he plans to establish a Chair of Traffic Engineering at the University of Birmingham and to develop a Graduate School of Highway Engineering.

Herbert Manzoni, city engineer of Birmingham, said it was proposed to send one of his staff to Yale because "the United States has brought the science of traffic engineering to a further stage of tabulation than England has and I think we ought to take advantage of American systematizing methods."

modern versatile

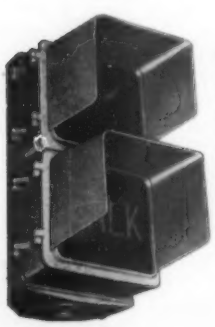
EAGLE traffic and pedestrian signals...

offer a wide range of installation and operation flexibility

YOU GET MORE FOR YOUR MONEY THROUGH THESE FEATURES

- INTERCHANGEABLE MATCHED SECTION DESIGN FOR 8" AND 12" SIGNALS — EASY TO ASSEMBLE
- ALL SECTIONS ARE DIE CAST ALUMINUM WITH FLAT INTEGRAL CLOSED ENDS FOR PERFECT ALIGNMENT
- NEOPRENE GASKETS THROUGHOUT
- ANTI-SUN PHANTOM OPTICAL UNIT
- SILVERED GLASS OR ALZAK PROCESSED ALUMINUM REFLECTORS
- SERRATIONS PROVIDE POSITIVE LOCKING OF SIGNAL OR SECTIONS IN 5 DEGREE INCREMENTS TO POINT IN ANY DIRECTION
- ENTIRE OPTICAL UNITS CAN BE DISASSEMBLED WITHOUT TOOLS

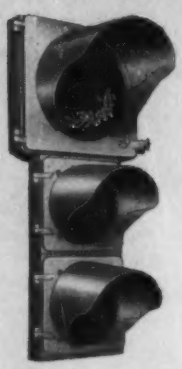
Engineering and construction features of top quality materials built into *every* EAGLE TRAFFIC SIGNAL is your assurance of years and years of continuous high performance. Present and future citizenry and officials will never criticize your choice when you select EAGLE traffic control equipment.



Model KB312
Pedestrian Signal

PEDESTRIAN SIGNALS

An Eagle exclusive. Distinctive square shape, prismatic lens with 3" high letters in each section that imparts a clear separate message. Illuminated by standard traffic signal lamp — NO TRANSFORMER REQUIRED. Mounts on standard signal brackets.

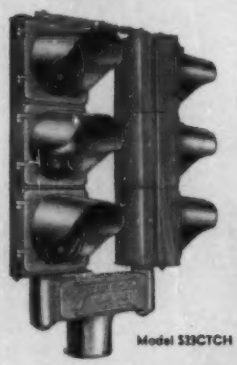


Model KB293, 12" red, 8" green and amber

Model KB302, 12" lenses

12" SIGNALS

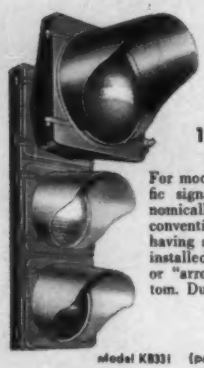
For extra long range visibility in rural and high speed highways, Eagle's extra large lenses, a full 12" in diameter, provide greater visibility for motorists. Red, Amber and Green lenses are available in either "Wide-Angle" or "Narrow-Beam" type.



Model S33CTCH

TWO AND THREE-WAY TERMINAL COMPARTMENT SIGNALS

These signals are designed for slip fitter mounting at top of standard 4½" O.D. pedestals. Wide opening and large terminal block provides maximum accessibility and wiring ease.



Model KB331 (patent applied for)

12" SIGNAL ADAPTER

For modernizing existing traffic signals quickly and economically. Adaptable to all conventional 8" signal heads having square doors. May be installed as a 12" red at top or "arrow" indication at bottom. Dustproof — waterproof.

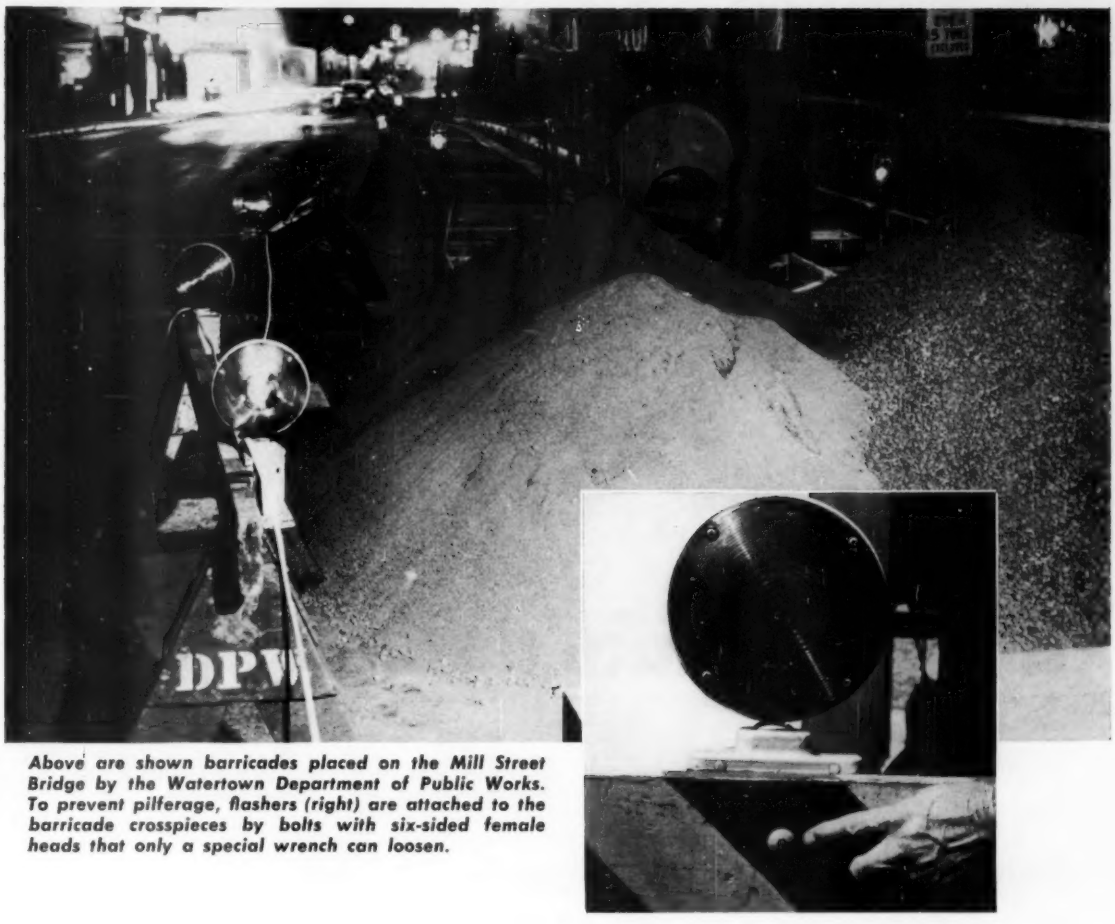
Model KB879 — 12" Square Signal

LANE SIGNALS

For use where the direction of travel in center lanes is changed at various times of the day. These signal indications are designed to be different and distinctive from regular signal indications. Illuminated backgrounds are red and green with opaque black indications. Can also be used as a pedestrian signal with large 4½" letters.

Write for Eagle's complete descriptive Traffic Signal Bulletin A10. Address Dept. AC-1259

EAGLE SIGNAL COMPANY
A DIVISION OF THE GAMEWELL COMPANY
Municipal Division
MOLINE, ILLINOIS



Above are shown barricades placed on the Mill Street Bridge by the Watertown Department of Public Works. To prevent pilferage, flashers (right) are attached to the barricade crosspieces by bolts with six-sided female heads that only a special wrench can loosen.

Flasher Barricades in Watertown

By **RAY HOWARD**, Superintendent
Department of Public Works,
Watertown, New York

To call attention to city street, road or sidewalk construction sites, we are using flashers almost exclusively—the transistorized, battery-operated type, bolted in pairs to wooden barricades.

Only in winter, when snow conditions in this northern New York city of 36,000 limit visibility drastically, do we employ torches at work sites.

Motorists, in order to gauge distances against a totally white background or against a murky winter sky, focus their attention downward at the ground. As a result, during the cold months, torches are seen more clearly than flashers.

A two-man crew from the Department of Public Works, whose primary job is checking sewage stoppages, places and maintains the flashers and barricades. Orders from foremen of field crews are collated daily. At 4:30 P.M., acting on these written orders, the flasher placement crew spots flasher-equipped barricades wherever they are needed.

Equipment

Department flasher equipment consists of two Dietz Visi-Flash models with 7-inch and 4-inch lens, 60 to 70 flashes per minute. The two transistorized units operate at six volts, using two standard electric lantern batteries with a life span of 1,500 hours. Their double-face lenses cover a 90-degree field both front and back. Although we use both yellow and red

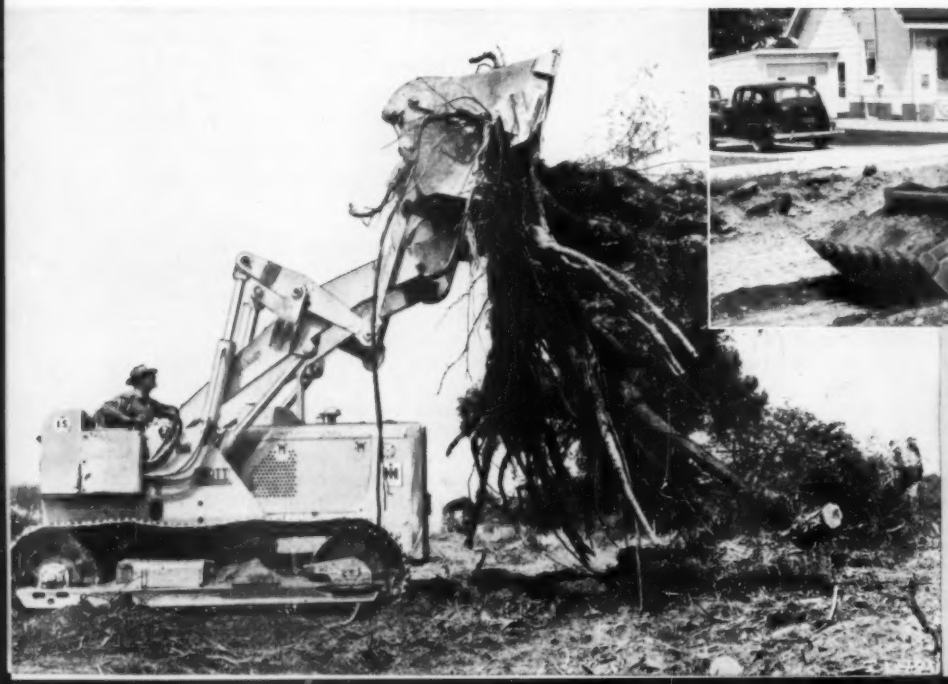
Sticky clay quits sticking—with exclusive 4-in-1 bottom dumping. Opening this clam pulls the material from bucket surfaces—gravity pull does the rest. You get positive 4-in-1 dumping, even of wet, sticky materials that idle ordinary, roll-forward buckets!

"Several machines in one save us time, labor expense, and additional equipment cost," states E. L. Quisenberry, Town Manager, Farmville, Va. Here their Turbocharged, 6-cylinder TD-9 Four-in-One is covering refuse evenly on-the-go with easily-controlled "carry-type scraper" action. Operator then uses compactor-plate action to *iron-down* the cover. No other rig even approaches 4-in-1 efficiency and economy operating the sanitary landfill!

Exclusive earth-peeling "carry-type scraper" action "boils" material into the bucket—as this new 6-cylinder TD-9 Four-in-One accurately grades for streets, sidewalks, and driveways in a new Cleveland, Ohio, suburb. Outfit practically eliminates handwork follow-up!

How to replace a whole spread of with a clam-action

Switch machine-actions <u>instantly</u> to efficiently do any job at hand!



"Greatest rig ever made for land clearing" declares operator K. G. Sanders. "We handle jobs ordinary loaders can't do." Clearing right-of-way for Big Dalton Flood Control Project near Covina, California. This TD-15 "clams on" to multi-ton stumps other buckets couldn't budge—loads these "impossibles," and wood-and-mortar building debris, with ease!

specialized rigs

4-in-1

Fingertip easy, you move the selector lever—to instantly switch the 4-in-1 to the machine action needed to do the job at hand!

Load, bulldoze, strip, cover, excavate, clear, compact, grade, develop sites, landscape, and also beat any other rig on the market operating the sanitary landfill. Any of the five clam-action 4-in-1 sizes (¾ to 3 cu yd) can give your community this exclusive versatility unlimited!

You get a whole equipment spread of actions in the clam-action 4-in-1. Each big-capacity action "doubles" for one or more specialized machines. You adjust and control hydraulically each 4-in-1 action, to get an amazing range of job-handling working positions!

Price all the machines the 4-in-1 can replace for your community—then total up the thousands of dollars you'd save with 4-in-1 ability to handle multi-operation jobs. See how only International Drott gives you 6-cylinder wallop and smoothness in all four diesel models—plus sintered metal faced engine clutch full-torque efficiency—plus exclusive dual-protected Dura Roller upkeep ease—plus exclusive, shock-swallowing Hydro-Spring performance protection! See your International Drott Distributor for a 4-in-1 demonstration!

"The 4-in-1 adapts to every job," reports J. J. Surovik, Franklin, Pa. "It gives all-around versatility to handle all phases of the work." Clamshell action "surrounds" loose materials—speedily heaps the bucket every pass. Preparing for paving an Erie, Pa., street, this TD-9 Four-in-One grades with inch-close accuracy!

Using "rock-busting" 4-in-1 pry-action to rip up old pavement and make way for a Toledo, Ohio, parking lot. Area is then leveled and graded, and prepared for resurfacing by the precisely-controlled, clam-action TD-6 Four-in-One! Pry-out force of the TD-6 is 18,600 lbs—and a whopping 43,000 lbs on the 3 cu yd TD-20!

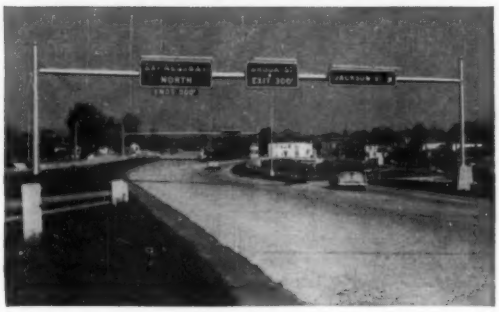
International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL®
DROTT®

Here's help for

HIGHWAY PLANNERS

MONOTUBE LIGHTING POLES



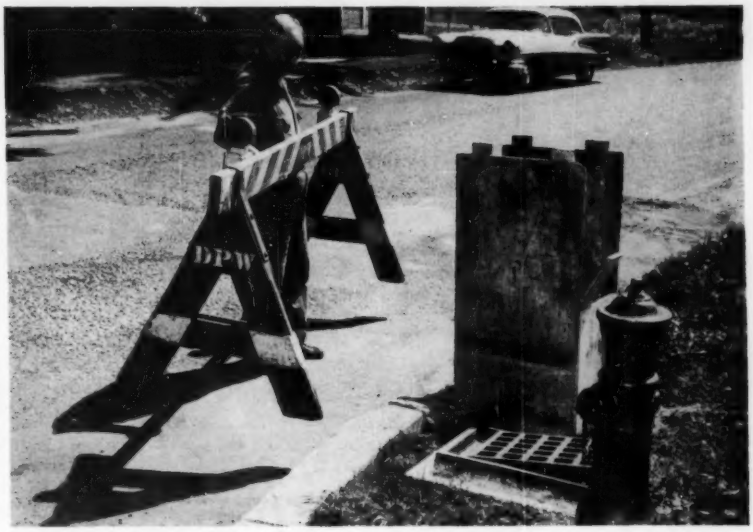
MONOTUBE SIGN SUPPORTS

MONOTUBE FOUNDATION PILES

Monotube poles, piles and overhead sign supports, used on many of the nation's leading highways, help provide increased driver safety, improved traffic flow, and economy in various phases of highway construction.

THE
UNION METAL
MANUFACTURING CO.

Canton 5, Ohio • Brampton, Ont., Canada



To guard this catch-basin form, Ray Ormsby, of the Department's flasher placement crew, sets a barricade equipped with two Dietz No. 600 flashers against the form. Double faced flashers have narrow slits in lens housings so that they may be seen from any direction.

lenses, we find the red fixtures provide the best illumination.

We maintain a total of 240 flashers—110 in stock and 130 at the construction sites. Most of those in use are the 4-inch units, since the bulk of the Department's work is at off-the-street areas. The 7-inchers are placed mainly along main thoroughfares.

All barricades are wooden and are made in departmental shops. When struck violently, wooden barricades are less hazardous than steel and far cheaper and simpler to repair. They also are easily assembled, handled and positioned. Thefts have been minimized by the special bolting shown in the picture on p. 115.

We use small, yard-wide sidewalk barricades and large barriers that extend almost eight feet in length and stand waist high.

Recognizing that safety precautions vary with the season, we have divided the work year into two periods, summer and winter. In summer, main street barricades are fitted with only the larger flashers, with at least two flashers to a barricade and two barricades to a work location. Barricade lighting layouts for secondary streets or off-the-street areas are left to the discretion of the flasher pick-up and maintenance crew.

In Winter

In the winter period, which includes fall and late spring, the summer barricade lighting layouts are doubled. Where two barricades, equipped with four large flashers, were used, four barricades with eight 7-inch units are installed. In addition, during severe storms, torches are added to these main thoroughfare work sites.

Ten-Foot Standard for Special Locations

Octa-Tube lighting standards styled like street models and equipped with convenient plug-in electrical outlets will accommodate a variety of standard luminaires. There are two models: eight-foot and ten-foot. Built of welded steel in octagon cross section, they taper to the luminaire mounting. The tapered heavy steel base has a mounting flange for easy installation.

The handy electrical outlet in the base permits plug-in of electric power tools and lawn equipment. The manufacturer is Millerbernd Manufacturing Co., Winsted, Minn. The illustration shows a garden type of light pole.

Convenience outlet (with cap) in base

Fuses and outlet shown with base door removed

Reflectorize with *Lead-Free* No. 831 (High Index) and UB 68 (Medium Index) Sign Kits

Write today for free booklet. Contains test and specification data, application procedures, and other helpful information.

If you're in a sign budget dilemma, you'll solve your problem more readily with optical quality No. 831 and UB 68 Reflective Glass Beads. No. 831, best for white and yellow signs, and UB 68, for application in the darker pigmented colors, are *lead-free* . . . won't turn dark, provide extra reflectivity throughout a longer life for greater safety and economy.

Bead budgets go farther . . . the result of better research and engineering and advanced methods of manufacture. And with today's overall improvements in quality, gradation, and application techniques, you have the combination that spells better reflectorized signs for less—with *whitest white, lead-free, optical quality* glass beads by Flex-O-Lite. Write for details.

FLEX-O-LITE

FLEX-O-LITE MFG. CORPORATION

8301 FLEX-O-LITE DRIVE • P. O. BOX 3066 (AFFTON BRANCH)

ST. LOUIS 23, MISSOURI

As the streets of Alton, Ill., blossom out in new, modern lighting, Altonians cheer the city's new council-manager program. A full account of that program appears on pages 96 to 98 of this issue of THE AMERICAN CITY.

Alton's Lighting Program Toes the I. E. S. Mark

After a boost from the Alton (Illinois) Association of Commerce and with the association's continued encouragement, the Union Electric Co. of Missouri, in 1956, prepared a relighting proposal for the consideration of city officials. The company recommended a white-way system for the city's four business areas.

The city enlarged the utility's program to include all major traffic streets. The selection of the streets to be relighted was based upon traffic volumes and the number of night-time accidents.

The old downtown system was owned by the city and was in bad repair. The utility proposal, as adopted, was for a street lighting system designed according to the city's requirements and installed, maintained and operated by the utility.

Almost 900 new luminaires have been installed to complete the initial program. The white-way lighting consists of 20,000-lumen mercury vapor luminaires made by Westinghouse Electric Corp. The other streets, mostly residential in character, are lighted by 10,000- and 15,000-lumen incandescent fixtures made by Line Material Industries. The luminaires are mounted on wood poles.

The annual cost for energy and maintenance is $72,427 (1958). Illumination meets I.E.S. standards.

Lighting Fights for Birmingham Business

To make downtown Birmingham, Ala. attractive and to meet suburban shopping center competition, a mercury vapor lighting system has been installed. Old incandescent lamps of 3450, 5500, and 10,000 lumens were replaced with General Electric mercury lamps of 20,000 lumens on Union Metal poles. Downtown now basks in two or three times the illumination to which it was accustomed and the lights burn all night. Formerly they were extinguished at midnight or 1 a.m.

It was the Downtown Improvement Association which induced the city to install the lights and which raised part of the funds to defray the installation. Taller poles had to be installed. The city agreed to pay the increased lighting bill of about $18,000 a year to the Alabama Power Company.

Following the new lighting installation, the Chamber of Commerce promoted "Downtown Birmingham Days" with two night openings. The merchants reported the best business in their history and gave brighter lighting credit for part of this success.

Merchants also report that keeping the lights on all night has resulted in fewer robberies and smashed show windows. They feel that high intensity illumination is one of the most effective weapons in fighting the spread of suburban shopping centers.

The brilliance of downtown Birmingham's 20,000-lumen mercury vapor lights draws night shoppers to the area.

PARK-O-METER Pioneer IN AUTOMATION

Long before coining of the word AUTOMATION, Park-O-Meter pioneered in the field of automatic operation which, today, is sweeping into every activity around the world.

Park-O-Meter . . . the first complete, automatic parking meter . . . was then, as today, the world's most MODERN parking meter.

Ask for detailed information regarding the latest model Park-O-Meter. Compare before you decide.

Ask for detailed information covering our completely automated **PARK-O-GATE** and ***Ticket Spitter*** Systems, for municipal or private off-street, self-service parking facilities.

Magee-Hale **PARK-O-METER COMPANY**

3909 Willow Springs Road
Oklahoma City 12, Oklahoma

Big Water Plant—Small Plant Site

(Continued from page 71)

pumps and plant supply pumps. The latter are DeLaval units rated at 200, 400, 800 and 1,000 gpm. Also one 200-gpm Pacific Pumping Co. unit with a Waukesha gasoline engine for emergency use.

Second Floor: Utility floor containing plant water pressure tanks, air conditioning and dehumidification equipment.

Third Floor: Offices, laboratory, lecture room and personnel facilities.

Fourth Floor: Filter wash-water tanks with a total capacity of 300,000 gallons.

The space at one end of the row of sedimentation basins, between the administration and chemical buildings, has been utilized as a garage area. Trucks can enter the garage and drive into the lower elevation of the chemical and filter building, thereby expediting the handling of equipment.

All buildings have reinforced-concrete substructures and structural-steel-framed superstructures with rose tan brick and light green insulated-steel wall-panel facing. The wall panels have porcelain-enamel surfaces on both sides. Exterior door frames and window sashes are aluminum. The exterior wall panels were all sealed with 3M two-part Thiokol building-panel caulking compound.

Water Wholesalers

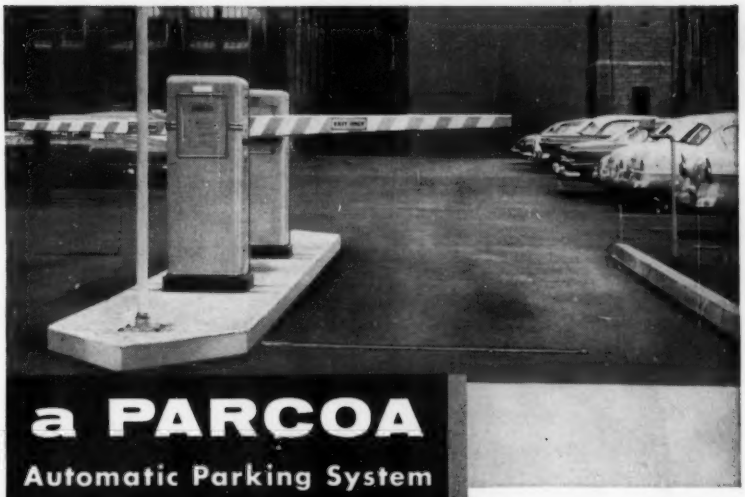
The Metropolitan Water District of Salt Lake City as a long-range planning agency is concerned primarily with water supply, transmission and purification, not distribution. The District supplies water at wholesale to Salt Lake City and the surrounding metropolitan area. Operation is under a five-man board of directors appointed by the mayor of Salt Lake City.

Funds for operation are acquired through the sale of water plus a tax against the real property of Salt Lake City.

Water at present is chlorinated only. However, that from Little Cottonwood Creek becomes highly turbid in spring runoff and during flash storms, and there are times during the year when the Deer Creek supply becomes turbid and unpleasant to the taste, particularly during the fall turnover in the reservoir.

The plant is being built to correct this condition. Financing is by means of an $8-million general obli-

FOR MUNICIPAL OFF-STREET PARKING



a PARCOA

Automatic Parking System . . . will easily solve your parking problem

You have full control of parking, day and night with PARCOA—

- You do it at low cost
- You have the finest operating equipment

Efficient performance is built in by parking specialists who have provided—

- for smooth, safe, fast parking—no confusion
- for operation without costly maintenance
- for operating flexibility and dependability

PARCOA is the pioneer in automatic parking systems and the recognized leader today. PARCOA engineers can install a parking system fitted to your specific needs with the overall installation based on the many successfully operating PARCOA automatic parking systems. Find out how PARCOA parking gates can solve your problems. Write for Bulletin No. 580.

Choice territories available. Distributor inquiries invited.

A few of the Municipalities that have solved their parking problems with Parcoa.

City of Battle Creek, Mich.	City of Oakland, California
City of Chicago, Illinois	City of Petersburg, Virginia
City of Cleveland, Ohio	City of Port Jervis, New York
City of Columbus, Indiana	City of San Jose, California
City of Columbus, Ohio	City of Sioux Falls, S. D.
City of Detroit, Michigan	City of Miami, Florida
City of Evanston, Illinois	City of South Orange, N. J.
City of Findlay, Ohio	City of Superior, Wisconsin
City of Grand Rapids, Mich.	City of Vincennes, Indiana
City of Ithaca, New York	City of Watertown, New York

FLEXIBLE OPERATION

These control types give you a choice of individual or combination of controls to fit your needs.

CODED CARD-KEY for cars parking on monthly or reserved basis.

COIN OPERATION for controlled transient parking

TICKET ISSUING SYSTEM for merchants restricted free parking service.

TIME-DATED TICKET DISPENSER for automatic self service in merchant participation parking.

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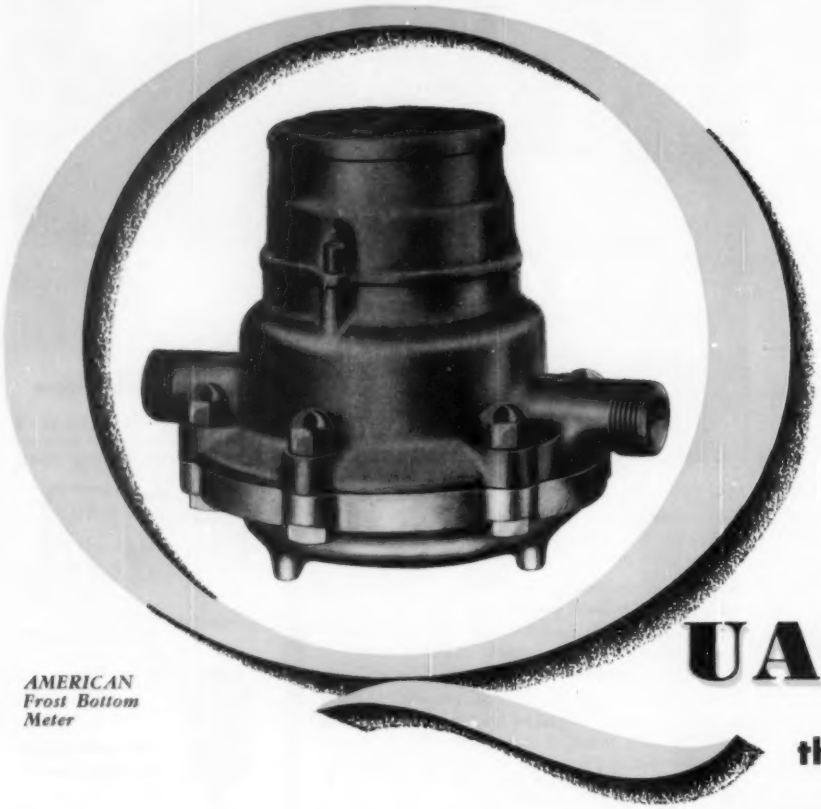
HAVE WHAT THE WATER SUPERINTENDENT WANTS



AMERICAN Frost Bottom Meter

QUALITY

that includes

- **WORKMANSHIP**
- **DURABILITY**
- **ACCURACY**

Everyone claims quality . . . finest quality . . . best quality —but like the pudding that is proven in the eating—so the proof of quality in a meter is in the running. This establishes its accuracy, and in continued running for long periods of time, its durability.

Judged on that basis, AMERICAN METERS are unsurpassed! For in operation, the fine workmanship, the excellence of manufacture of AMERICAN METERS are clearly demonstrated. AMERICAN METERS today are built to exceed the accuracy and life of meters built 35 years ago, that are still giving dependable accurate service. Yes truly, AMERICAN is a QUALITY WATER METER.

Quality Control at each manufacturing step insures the accuracy and reliability of American Meters.

BUFFALO METER COMPANY INCORPORATED 2902 Main Street, Buffalo 14, N. Y.

gation bond issue of which $7.5-million worth has been sold. Cash reserves will be used to make the early payments. Plans call for amortizing the bonds without a rate increase or an increase in the tax levy.

Work on the plant went ahead after completion of two separate feasibility studies, one by John A. Carollo and the other by the Kansas City, Mo. firm of Black & Veatch. Both reports contained essentially the same recommendations regarding type of plant and location.

Richard P. Olbert is the resident engineer and is assisted by H. M. Way and John Beck. Vaughn B. Wonnacott will be the plant superintendent and will be assisted by John Beck, now serving as inspector on the job. The general contractor is the Davis and Butler Construction Company of Salt Lake City.

Emergency Power For Dumont, N. J. Borough Hall

Dumont, N. J. has joined the ranks of communities that will continue normal operation even during total power black-outs, thanks to an emergency generator. Until recently, the only power available for lighting and operating loads in the Borough Hall, for the police radio system and for the operation of a 7½-hp Federal siren during such a black-out has been the normal power company service.

But a continuous supply of electric energy is now assured by single-phase, 4-wire, 120/240-volt, 35-kw Onan generator, driven by a Ford Industrial 6-cylinder gasoline engine. The direct-drive unit has been mounted in an extension added to the Borough Hall, because of limited space in the Hall itself.

An automatic transfer switch cuts in the generator unit when the normal power source falters. The husky unit is capable of supplying all necessary power for lighting the Hall, operating the siren and supplying communication power for four police patrol cars, four fire engines and the borough ambulance, all radio-equipped.

The unit has successfully performed under most rigid tests and is enthusiastically approved by Civil Defense Director of Communications A. E. Andresen, the mayor and all members of the Dumont Borough Council.

CARL F. KANTOLA, *Councilman*
Dumont, N. J.

Guard Your Sewer Lines...
Keep 'em clean!..free flowing
with Sanfax 222

...the remarkable, power-packed chemical that burns out tree roots, trash and impediments in record time.

☆Reduces labor
☆Slashes maintenance costs
☆Increases sewer line efficiency

Also use Sanfax 222 on a preventative maintenance basis for trouble-free assurance.

Thousands of Satisfied Users from Coast-to-Coast

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ELECTRIC POWER
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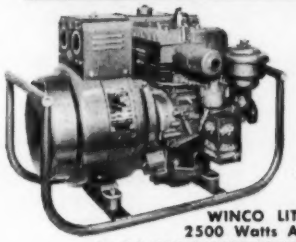
IDLING CONTROL
SAVES up to 60% in FUEL COST
For Every
MUNICIPAL DEPARTMENT



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2500 Watts AC
Model 205B143S2D-FM10C
with Exclusive FULL POWER Feature

WINCO Engine Generators are efficient and economical—provide power when and where needed by every Municipality. Complete line of portable and standby power plants from 1500 to 10,000 watts.

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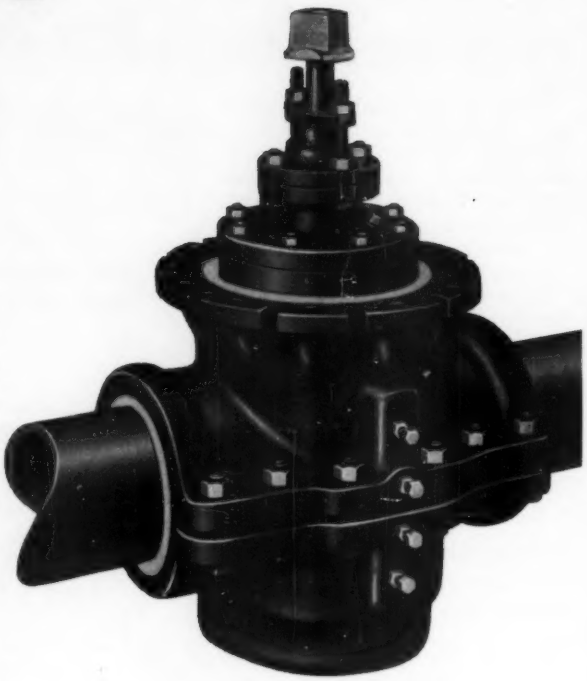
Please send free copy of new WINCO FULL LINE CATALOG

Name .....
Dept. .....
City ..... State .....

install valves *without* interrupting service!



You can add needed gate valves anywhere in your water system—without a shut-down—when you use **MUELLER®** Inserting Valves. These valves are specifically designed to be quickly, easily installed in any existing 4″, 6″ or 8″ cast iron main under full service pressure. There is no loss of water, no interruption of service and no loss of fire protection.

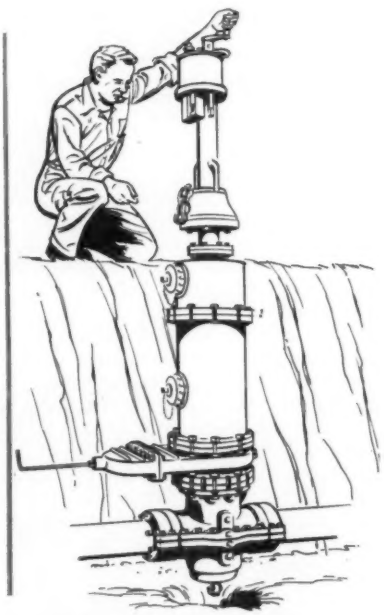
The gate valve mechanism of the Mueller Inserting Valve is identical to that of dependable Mueller AWWA Gate Valves and Mueller Tapping Valves. This permits standardizing on one type of valve mechanism for all your valve needs.

This product feature is typical of the attention to detail in research, design and engineering that becomes a part of every Mueller product produced for the water works industry.

here's how with Mueller Inserting Valves

1. Bolt sleeve halves to main and calk end joints.

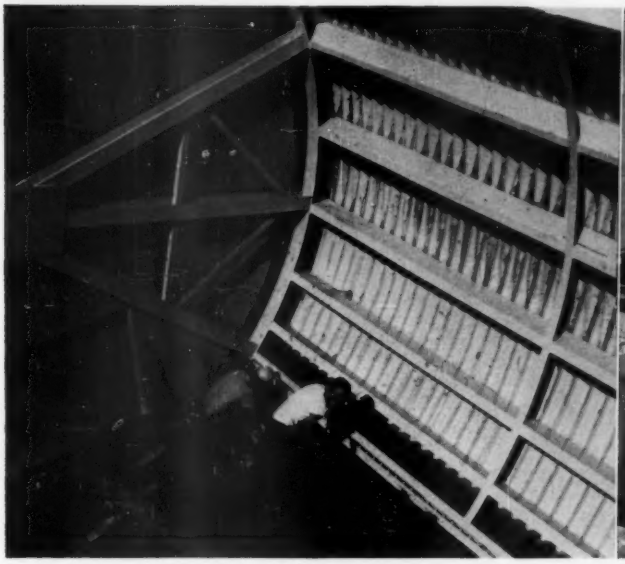
2. Cut out section of main with Mueller Drilling Machine.



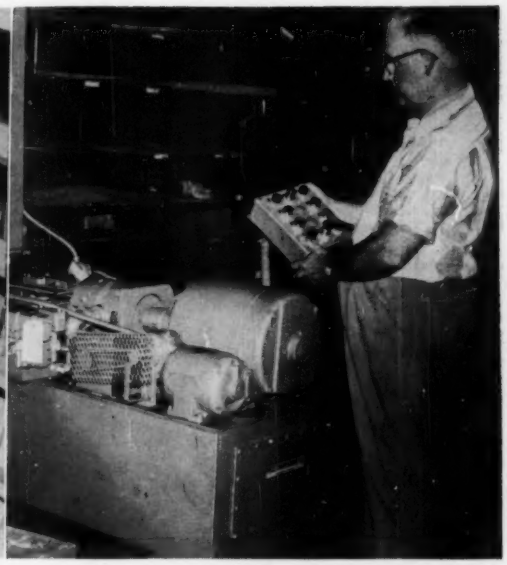
3. Lower valve plug assembly into main and secure.

MUELLER CO.
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario



Tainter gates simplify the operation of Madison's new system of locks and reduce overall costs.



A simple system of push buttons controls the gates.

Madison, Wis. increases the recreational value of its lakes by . . .

A New System of Locks

By **LYLE E. SCHALLER*** Director of Research

Late last summer Madison formally dedicated its new lock and dam connecting Lake Mendota to Lake Monona. In doing so, Mayor Ivan A. Nestingen officiated in a ceremony that will not be duplicated by any other mayor in the nation, so far as we know. Usually a county, state or federal authority operates facilities such as this. The construction of the locks resulted in a major step forward in inter-municipal cooperation in the Madison area.

Since 1846

Madison has been in the lock-and-dam business since 1846 when the Territorial Legislature authorized the construction of a dam across the Catfish River connecting the fourth of a series of lakes to the third lake. The Catfish River is now called the Yahara, the fourth lake is known as Lake Mendota, and the third, Lake Monona. However, consequences of that particular legislative act are still binding upon the city.

The past decade has seen a tremendous increase in the number of boats using the two lakes, pointing up the need for improvements. At times boats had to wait as much as two hours to pass through the locks and a wait of one hour was not unusual. On busy days, over 400 boats passed through the locks and the peak month totaled over 5,000. Moreover, boats in recent years have grown larger; by 1958 over 50 cruisers having beams of six to more than ten feet used the lakes.

Under the leadership of Mayor Nestingen, City Engineer John G. Thompson, and Park Superintendent James Marshall, a proposal was made to rebuild the locks. The Common Council approved the choice of John A. Strand, consulting engineer, as designer. The project included a lock tender's room, a boat-launching facility, public rest rooms, and a police boathouse having room for two cruisers. The entire project was bid at a cost of approximately $260,000.

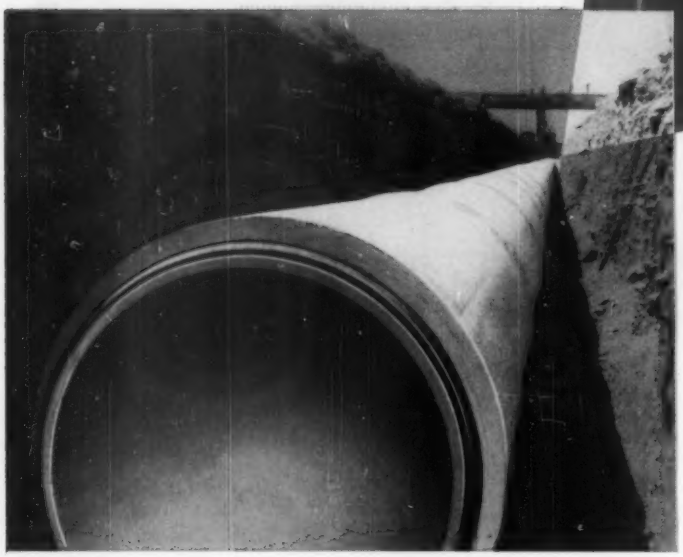
The old locks took four to five minutes to empty or to fill and would accommodate six to eight boats in the 10x50-foot chamber. The new locks measure 20 by 75 feet and can be emptied or filled in approximately 60 seconds. The new locks will move five times as many boats as the old. They were supplied by the Lab Weld Co., Fort Wayne, Ind.

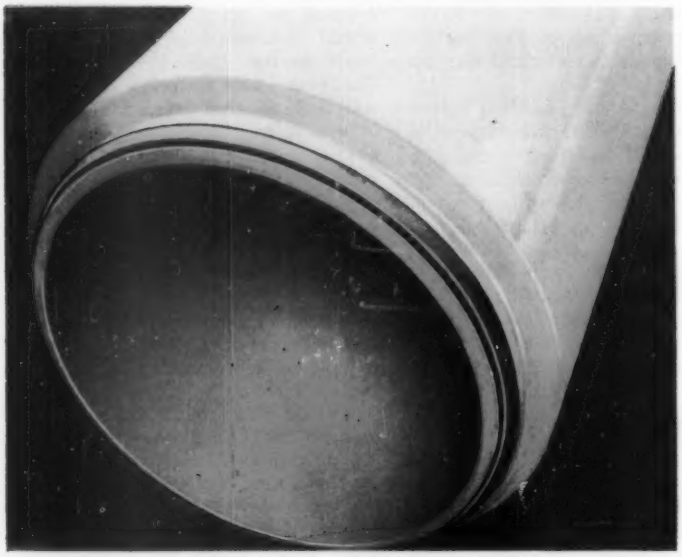
The unusual feature of the new system is the use of Tainter gates for the locks and control filling and emptying. By using these, instead of the traditional miter gates, we eliminated the expensive valves and conduits necessary for controlling the water flow and saved approximately $25,000. These gates are of a type usually found in dams built for flood control purposes. This is the first time they have been used for this dual purpose. The curved gates swing in an arc upward to allow boats to pass into or out of the locks. The gate is completely overhead as the boat passes through. The gates operate by gears using a hydraulic power system. They open slowly at first and, as the pressure of the water drops, the opening action accelerates. The gates incorporate a safety feature which will automatically stop the

* Mr. Schaller formerly was administrative assistant to Mayor Nestinger, Madison, Wis. He now is Director of Research, Cleveland Bureau of Governmental Research, Cleveland 15, Ohio.

Along the
Coeur d' Alene
By-Pass . . .

PRESS-SEAL makes 22,650 feet of pipe watertight





In constructing the Interstate Highway No. 90 By-Pass at Coeur d'Alene, Idaho, 22,650 feet of culvert and sewer pipe were laid in sizes ranging from 10" to 48" in diameter.

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PIPE SUPPLIER:
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action if, on the downward movement, they encounter any obstacle such as a boat, a log, or debris. Provision has also been made to prevent water from dripping from the gates, as they emerge from the water, down on occupants of the boats.

Push-Button Control

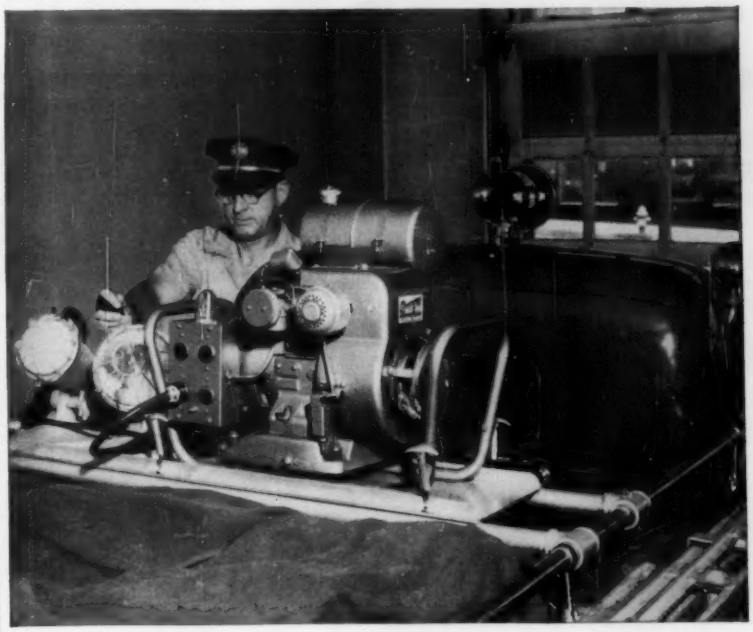
The entire operation is controlled from a push-button panel operated by the lock tender. Two buttons raise the gates, two close them, and an emergency button stops them in case of accident or malfunction. When Consulting Engineer John Strand proposed this system, some doubted that the raised gates would permit entry of large boats. However, under the plan he devised, the gates rise to a height necessary for the passage of any boat which is able to pass beneath the downstream bridges. The controls were assembled and installed by the Wisconsin Foundry Machine Co. of Madison.

Until a recent state Supreme Court decision invalidated the procedure, Madison had been licensing all boats using either Lake Mendota or Lake Monona. Over 4,500 boats were licensed in 1958 and a large proportion of these were owned by non-residents of the city. (Today the State of Wisconsin does not permit any charge to be levied.) Because of this heavy non-resident use, Mayor Nestingen proposed to the other municipalities in the Madison urban area that they share in the cost of construction of this facility which is of benefit to the entire area. Only one of the six municipalities accepted the invitation. The Village of Maple Bluff has voluntarily offered to pay $400 per year for each of the 20 years of the life of the bond issue. This payment is based on proportion of their assessed valuation to that of Madison and reflects the belief on the part of the village officials and residents that they should share in the cost of those city services from which they benefit.

Ousted Manager Elected Mayor

Charles R. Iovina, ousted last June as city manager of Milford, Conn., has been elected mayor by a write-in vote. He takes office under the "strong-mayor" plan, pushed last year to replace the council-manager system. He now has more power than he did as city manager.

Onan NEWS REPORT



Department uses two Onan plants to fight fires, and hurricanes, too!

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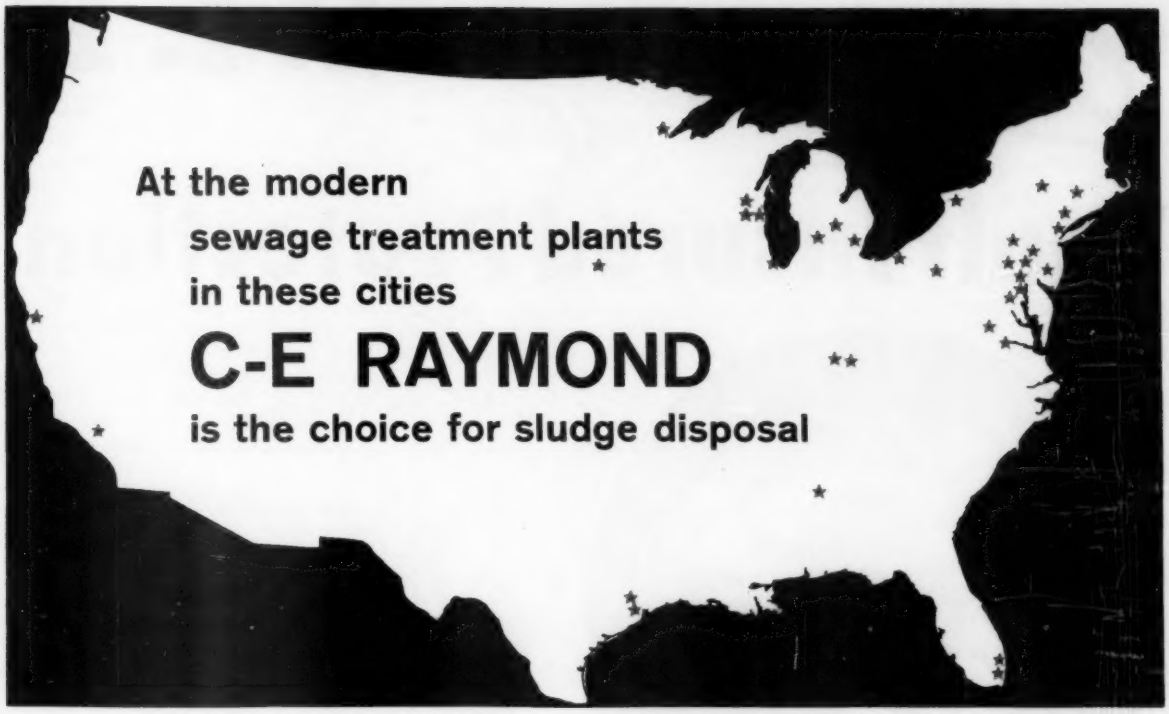

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Jefferson Co., Ala.
Lansing, Mich.
Los Angeles, Calif.
Louisville, Ky.
Lynchburg, Va.
Miami, Fla.
Neenah-Menasha, Wisc.
New Albany, Ind.
New Rochelle, N. Y.
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Petersburg, Va.
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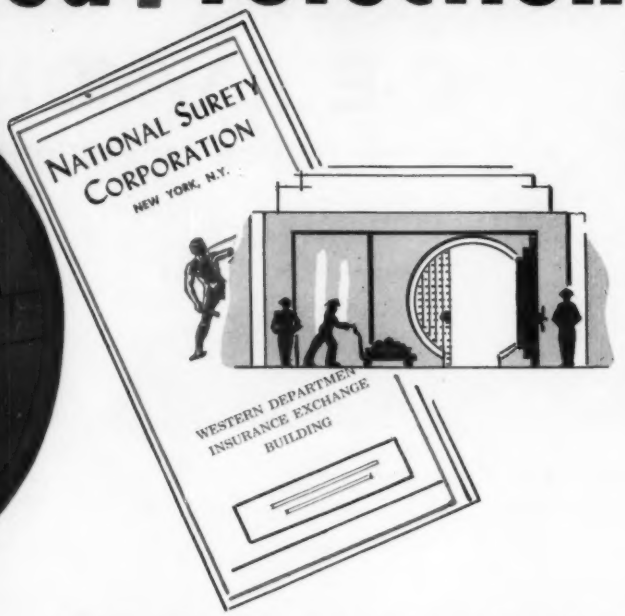

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City Managers Emphasize "Humanities"

The council-manager movement no longer sacrifices all at the altar of the cold-eyed god, Efficiency. This was obvious at the recent meeting of the International City Managers' Association held in St. Louis. During the conference, managers expressed thoughts such as these:

- **The public has the right to the more expensive way, if it wants.**
- **In a choice between the democratic vs. the efficient way, always choose the democratic.**
- **Oftentimes, in routine public decisions, such as street locations, the "expert" way is not always the best.**
- **Ward representation is *not* a dirty term.**

At the same time, they did not let efficiency go by default (*We must advise our work crews that you aren't always sick when you sweat*).

They urged in-service training (*Experience on the job often means doing the same job wrong, over and over*). Discussors recommended that under such a program, the city donate an hour and the employee an hour; and that the city purchase the books. They observed that the universities are adept at filling their students with information, but fail to teach them communication. Useful courses that correct such deficiencies have included:

- **good telephone manners**
- **speed reading**
- **public speaking**
- **business writing**

At the same time, they warned against training just for the sake of training and recommended tailoring the courses to the actual need.

Keeping the mayor and council informed discreetly also was analyzed. John B. Wentz, city manager, Beverly Hills, Calif., cautioned against overselling a program to the council. He also urged that the mayor and council be informed first, by telephone if necessary, about important town events such as accidents, robberies, deaths of important people, successful bidders on municipal projects. "A public news letter," he said, "will refresh the council about events they have been studying and will counteract a poor press."

The touchy subject of fire-police integration drew a lot of attention. Most observed that the work week of the firemen was dropping and would continue. When it hits 48 hours, said R. E. Harbaugh, Galesburg, Ill., fire department organization reaches a turning point. Scheduling should be on the basis of eight hours a day, six days a week. Beds and kitchens should be removed and firemen stationed on the ground floor. Also a cooperating program of some kind between fire and some other department is feasible and practical. Said one other manager, there are other able-bodied city employees besides policemen.

The conferees noted that Sunnyvale, Calif., has adopted a fire-policeman program and has bettered its insurance rating.

On the subject of metropolitan regional government, the managers heard words of caution. Dr. G. Y. Steiner, Director of the Institute of Government, University of Illinois, observed that the Dade County, Fla. metropolitan plan, like the

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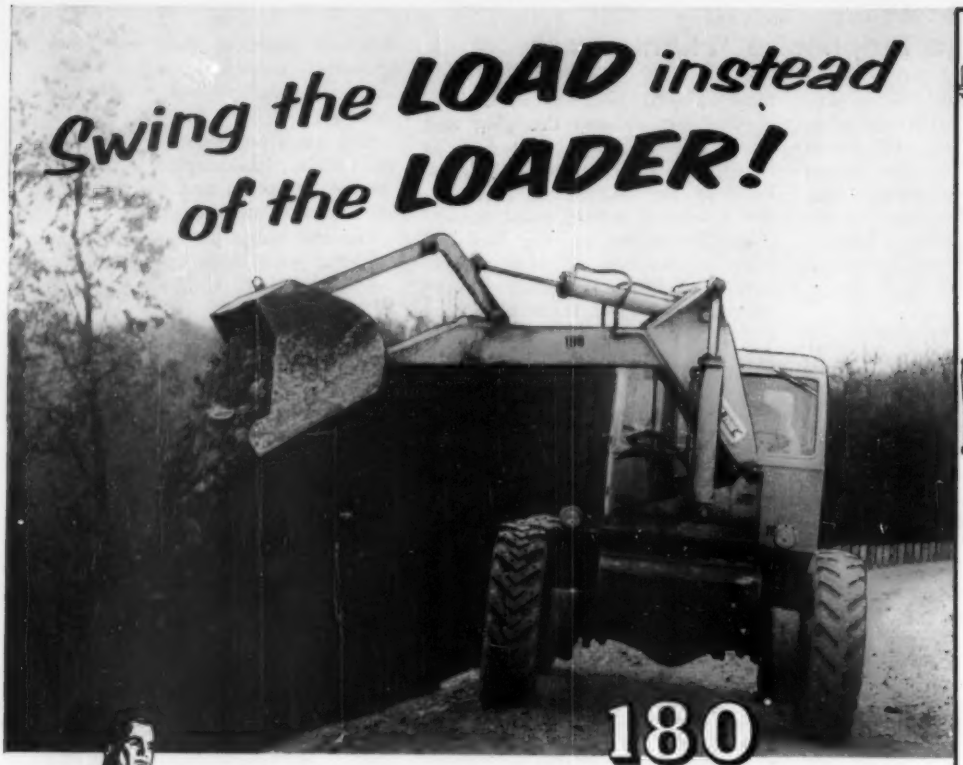

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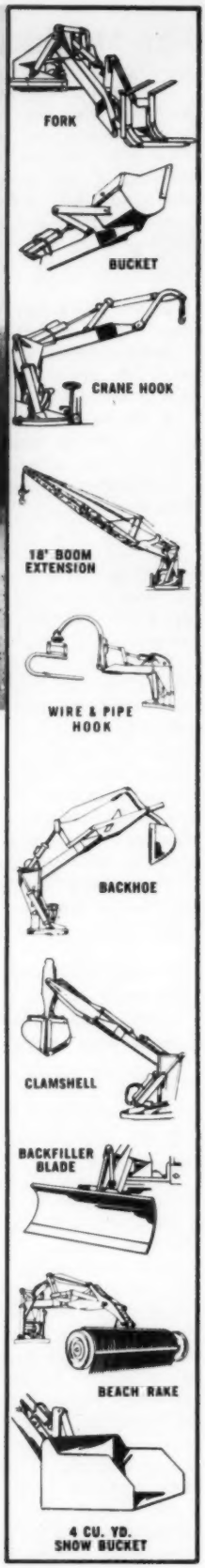

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Nebraska unicameral legislature probably would go down as an interesting experiment that did not take hold. Of interest in this connection was the fact that a capaign for metropolitan government in the St. Louis area was at its height when the managers met. In the election, this proposal failed decisively.

Litter Baskets For New York City

It behooves a city, which conducts an aggressive drive against littering its streets and assesses heavy fines, to provide a reasonable number of waste receptacles. New York is such a city. Its 18,000 trash baskets were inadequate and a contract has been awarded for 14,587 expanded metal baskets.

The low bidder among five companies submitting quotations on the new baskets was Astoria Industries, Inc., 36-06 Steinway Street, Astoria, Queens, N. Y., whose price was $13.69 per basket.

The new containers will be 30 inches high and will weigh 48 pounds. Their top diameter will be 20½ inches. The old baskets are 34 inches high and weigh 60 pounds. The aluminum-painted baskets will feature ⅝ inch, No. 9-gauge metal expanded to provide a diamond mesh. The diamond will be 1¼ inches in height and 7/16th-inch wide —purposely small to prevent the escape of paper scraps.

Commissioner Screvane, Mayor Wagner, Harold McGraw and President Clifton Phalen of the Citizens' Committee to Keep New York City Clean inspect some of the baskets and an eight-foot model.

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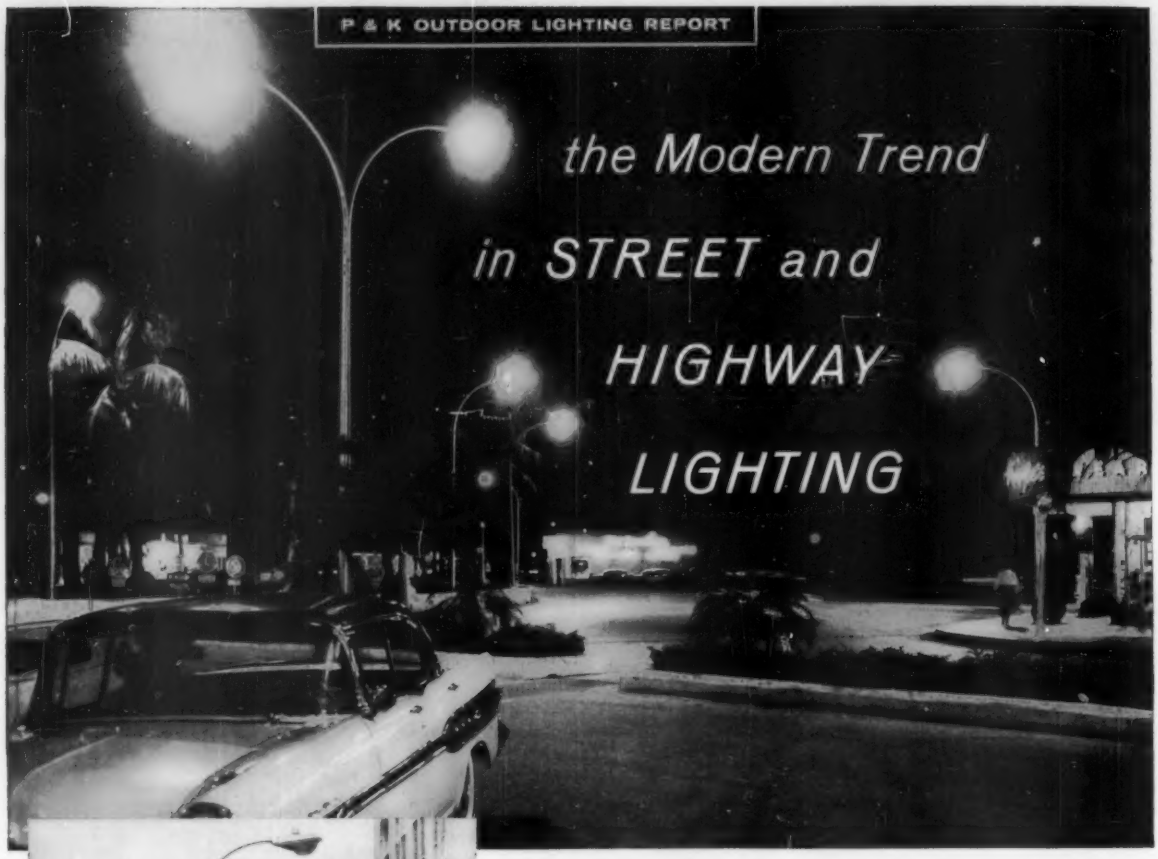

TOP PHOTO: Traffic circle illumination— West Miami Springs, Florida

LOWER PHOTO: New White Way—White Plains, New York

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Modern Traffic Signal Practice

By **GEORGE W. HOWIE**, Director
Department of Utilities, Cincinnati, Ohio

For the first time since the extensive re-editing of more than 20 years ago, changes in the Traffic Signal section of the Manual on Uniform Traffic Control Devices for Streets and Highways have been developed by a subcommittee of the National Joint Committee on Uniform Traffic Control Devices. The changes recognize the improvements in equipment. Assuming that the Joint Committee and its sponsoring organizations approve the revisions which are as yet in preliminary form, here are some typical examples in the new section on Traffic Signals:

Use of the twelve-inch traffic signal head will be covered for the first time. The use of portable traffic signals will be outlined for the first time, and warrants for their use, together with minimum standards for application, will be detailed. The portable unit is approved for use very specifically as a temporary expedient covering strictly transient conditions, but not on a repeated day-after-day basis at such locations as school or factory crossings.

Pedestrian signals assume much greater importance in the proposed new manual. The square or rectangular pedestrian "Walk-Wait" or "Walk-Don't Walk" unit, in incandescent, neon grid or formed neon lettering, is specified as standard in place of the 6-inch round unit.

We expect that the new edition will be outspokenly favorable to vehicular signal mounting out over the roadway and over the lanes which the signal heads control. Visibility over greater approach distances, and placement of the signal unit where it is clearly visible from the stopline or point of obedience, will be recommended practice. This generally will require far-side mounting of signal heads on mast arms, span wires or light rigid-frame structures over the roadway.

Major revisions cover such factors as minimizing delay on the main street by means of adequate detection, the detailed features of volume density equipment which was unknown at the time the present manual was written, application of traffic actuated equipment in coordinated operation, the coverage of newer detectors, new descriptive material on red-delay and all-red intervals, the collection of data by detector placement on arterials and in networks, and detailed technical data on such subjects as recall switches, speed control, pedestrian phasing and adjustment of volume density equipment. Two new sections cover three movement semi-actuated control with two vehicle phases and one pedestrian phase, and three movement, full actuated control with similar phasing.

Fixed Time Signals

The recommended new warrants for fixed time signals are based upon these principal objectives:

To give more recognition to the importance of morning and afternoon rush periods.

To recognize multiple lane approaches as a factor in total volume analysis, and in relation to cross traffic.

To introduce approach speed into calculation of warrants.

To give greater weight to the heaviest direction of travel.

Revision of pedestrian volume warrants places greater emphasis on "heaviest direction of flow" or "highest volume crosswalk", crossing the main street. A particularly meaningful revision is a proposal that pedestrian push-button semi-actuated equipment must be used if the signal is found to be warranted upon the basis of pedestrian volume. Says Martin Bruening on this point, "We are of the opinion that an absolutely inflexible fixed-time control apparatus primarily for pedestrian use is no longer appropriate and should not be recognized in so significant a publication as the Uniform Manual."

Traffic accident experience has indicated for many years that traffic signals installed in a busy traffic stream are not likely to reduce the total number of accidents occurring, or even to reduce the total severity of the accident pattern. In performing their primary function of assigning right of way, signals are likely to reduce the number of right angle collisions but at the same time to increase internal stream friction and produce rear-end and side-swipe collisions. They are likely to improve the pedestrian accident pattern, particularly if the signal installation is accompanied by installation of pedestrian refuges and medial islands.

The proposed new warrants take a step toward debunking the popular concept that accident reduction or accident prevention invariably can be achieved by installation of traffic signals.

Changes proposed in traffic-actuated signal warrants are much less extensive, as might be expected in view of the adaptability of actuated units to a wide range of variation in traffic demand. Emphasis is placed on the merits of full-actuated equipment. The undesirability of undue delay to main street traffic is pointed out, if minor street traffic makes frequent calls in non-interconnected semi-actuated installations.

Where widely varying traffic situations are encountered in an interconnected system, on a thoroughfare or in a street network, the merits of traffic actuated cycles and offsets are recognized in the proposed rewording of the Manual for the first time. Pedestrian signal warrants are modified by the addition of two important considerations:

1. When an intersection is so large and complicated, or a street so wide that vehicle signals would not serve pedestrians well.

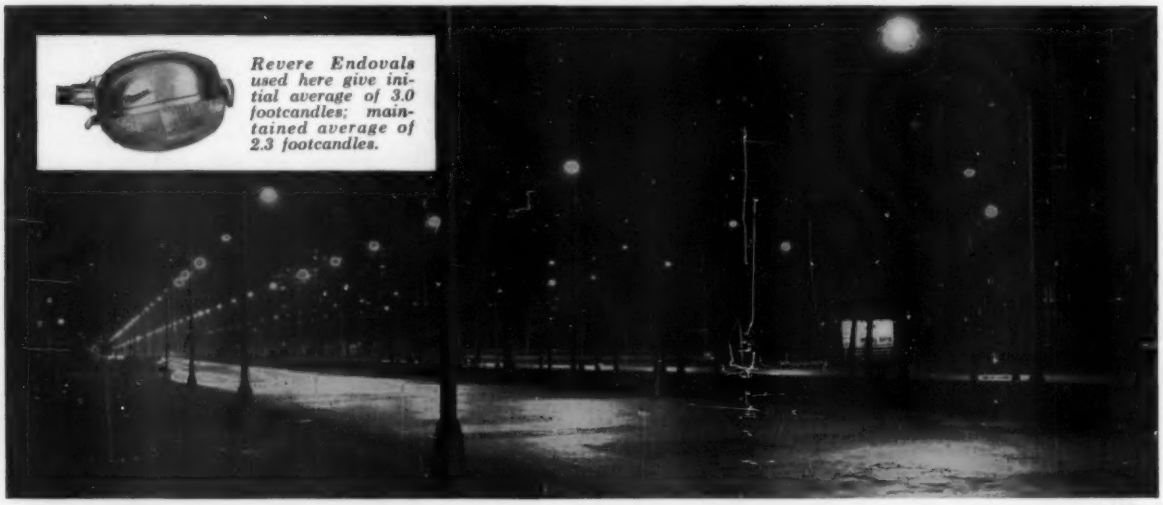
2. When the minimum green interval for vehicles, at intersections with traffic actuated control, may be less than the time required for pedestrians to cross.

It is proposed also that the warrant for adding pedestrian units at an already signalized intersection (or one about to be signalized from the standpoint of vehicular war-

EDITOR'S NOTE: This article is taken from an address given by Mr. Howie before the 64th annual conference of the International Municipal Signal Association, held in Las Vegas, October 19-22, 1959.

This busy Chicago boulevard has Revere Endoval Mercury Luminaires mounted at 10° tilt, 32 ft. above grade. Poles are spaced 50 feet apart, staggered.

REVERE PLANNED STREET LIGHTING



Revere Endovals used here give initial average of 3.0 footcandles; maintained average of 2.3 footcandles.

For wide, busy streets, Revere Endoval Luminaires use 11,000 or 21,000-lumen mercury lamps to provide high-level, glare-free illumination. Choice of light distribution patterns, plus a reversible slip fitter that permits mounting horizontally or at a 10° tilt, makes the Endoval adaptable to a wide variety of high-intensity street lighting applications. Special features make installation and servicing easy too. Write for Revere Street Lighting Catalog.

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rants) shall be cut from 500 persons per hour for eight hours, to 250 persons per hour for eight hours.

The pedestrian signal warrants seem strengthened by this quotation from a recent issue of Highway Research Abstracts: "There were 24,830 pedestrians injured crossing intersections with the signal in their favor during 1958 in the United States."

Colors

The prevailing thinking is toward retaining the present color limits for yellow and for green signals, but to authorize a brighter, or more yellow, red signal. This brighter limit already is in use in the 12-inch traffic signal lens and its extension to use in the 8-inch lens seems likely.

Color standards for pedestrian units have proven most difficult to achieve. Colors which are acceptable for incandescent units seem difficult to duplicate in neon, and vice versa. It appears that the committees working on this problem will arrive at a red or orange for the wait or *don't walk*, and a lunar blue, turquoise blue or blue-green for the walk unit. Our own experience strongly favors a vivid red-orange and brilliant torquoise blue combination, which can be achieved in neon and which proves very pleasing to the eye as well as effective in traffic control over a wide range of atmospheric conditions.

The 100 plus neon grid units of this type now in use in Cincinnati have gained good public acceptance and unstinted praise from the traffic professionals who have viewed them. Rectangular incandescent units of almost exactly the same color combination recently have come into general use in Michigan. They provide a pleasing and effective contrast with standard vehicular signals.

My co-workers on this project of the Joint Committee include: Teke Wiley, Wilbur Smith, Holden LeRoy, Fred Meno, James Rudden, Marble Hensley, Ben McKay, Charles Prisk, William Eliot, Leslie Sorensen, William Marston, Dick Fenel, Charles Michalski, Martin Bruening and Wayne Volk of the Institute of Traffic Engineers, J. R. Murphy of Association of American Railroads, and Bob DeKay, Paul Green, W. H. Peterson and Roy Fielding of the manufacturers. To this group must go the credit for the progress made toward revision of this section of the Manual.

New Idea in Radiation Dosimeters

Long glass fibers, coiled into a small spool or disk, might be used to measure exposure to gamma radiation. Scientists at the Armour Research Foundation of Illinois Institute of Technology say that the glass fibers could be calibrated like a thermometer. Exposure to radiation darkens the fibers, permitting an immediate reading. Conceivably, this type of glass dosimeter could replace film, almost universally used as a radiation indicator, but which must be developed to determine the extent of exposure. Such a device might prove practical for civil defense determination of radiation following atomic attack.

Research in fiber optics at the Foundation stimulated the idea for a dosimeter made of long glass fibers. Increasing the length of glass by stretching it into strands six to ten feet long makes it easier to detect radiation, and increases the sensitivity as much as 100 times.

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Mobile Home Parks Can Be A Community Asset

By STEPHEN SUSSNA*
Planning Consultant

The demand for mobile dwelling is now much more complex than it was in the old World War II days of "trailer camps." Today, mobile homes provide a practical way to supply satisfactory housing for newly married couples and those that are older and retired. Builders have difficulty providing homes or apartments to meet this need without some sort of subsidy and, despite resistance, generally at a local level, the demand for mobile homes has sharply increased.

The modern unit is a prefabricated home that often contains 3 rooms, bath, and kitchen. It has modern appliances, built-in furniture and even fireplaces. It is frequently 50 feet long and 10 feet wide, the maximum allowed by state highway laws. Indeed some current units are two stories high.

Unfortunately, the old repeated accusation that the average mobile-home site is poor is only too true. One can find exceptions only in Arizona, California, Florida, and in certain isolated examples elsewhere.

Local governments have been suspicious of "trailer camps" and dropped any lenient attitudes towards them at the war's end. Nevertheless, the demand for mobile homes and the need for parks have increased. Consequently, we have seen these parks, when allowed, shunted to commercial and industrial districts where they never have had opportunity to develop into anything of an attractive, home-like character, where regulation is careless and indifferent and where shoe-string operators have blighted the highways and given this type of home a bad name.

Running through a great number of the court opinions concerning zoning "trailers" and "trailer parks" one can detect some judicial disdain and bewilderment. Courts have grappled with such questions as to whether they are buildings. Rarely does a court opinion answer such questions as these:

- **How will a proposed park affect the present and near future of the community's people?**
- **What will it do to existing property values, aesthetic features, land use, population concentration, traffic, municipal facilities and services, the park proposal, and the community's plan?**

To write generally that all parks should be included in the residential zone or the commercial zone, or any other zone is meaningless. Inclusion or exclusion in a particular zone depends on the fostering of a complex goal—harmony with other uses in the district. More than the protection of existing real estate values is involved. State zoning statutes wisely require that all zoning be in accord with a comprehensive plan, that zoning recognize the existing character of particular districts, and that it encourage the most appropriate use of land throughout the community. "Trailerites" and "trailer park" owners also merit whatever benefits zoning has to offer.

Very little has been done by our universities and our planning agencies to probe questions pertaining to school and other costs, municipal finance, park design. The little study that has been completed indicates:

- **That the mobile homes constitute residential housing in that they are basically prefabricated homes. Their mobility does not change this finding.**
- **That the oft-repeated charges about the "free-tax ride" that "trailerites" take is not true in a number of communities and certainly does not have to be true for others. A lot more thought and resourcefulness could be used to resolve the field of local finance.**
- **that the socio-economic caliber of home occupants is as high or higher than other Americans.**

It is important and interesting to note the great changes of outlook and development that occurred in

* Mr. Sussna is a planning and zoning consultant with offices at 225 East Hanover Street in Trenton, N. J. He is the author of the planning article "Cluster Garden Subdivision" appearing in THE AMERICAN CITY, July 1959, p. 109).

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the motel field, once ramshackle units were replaced with comfortable and attractive motels. Here is an instance where the good replaced the bad and it can happen in the field of mobile home parks throughout the country.

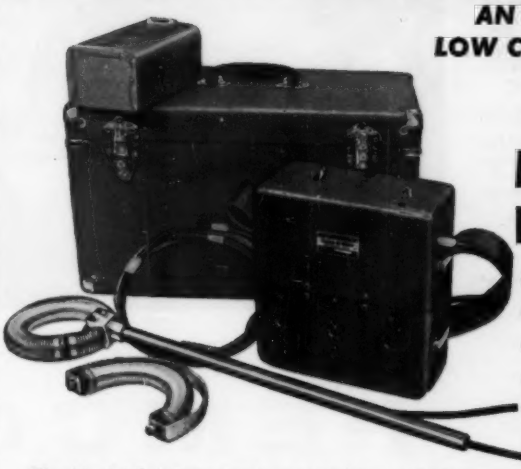
The integration of planning engineering, and landscape-architecture talents can produce park designs that feature spacious landscaped plots which will insure privacy, well-laid out thoroughfares, conveniently located service and recreation areas and other features found only in first-rate subdivision designs.

San Francisco Sets Standards for Rapid Transit

Minimum operating and equipment standards of the proposed San Francisco Bay Area rapid transit system have been established by the District and its consulting engineers. They include:

1. The system must operate on its own grade-separated right-of-way.
2. The system must have a capacity sufficient to transport at least 30,000 seated passengers per lane per hour.
3. Rapid transit trains must attain maximum speeds of 75 to 80 mph, and must maintain average speeds — including station stops — of 45 mph.
4. A high rate of acceleration—minimum 3 mph per second, maximum 3.7 mph per second—is required.
5. The system must schedule trains as frequently as every 90 seconds during peak periods, and the interval should never be greater than five minutes during the commuting hours.
6. Trains must be designed for the maximum in passenger comfort, with adequate seat, aisle and window dimensions, internal temperature controls, a pleasing appearance, freedom from noxious odors, low internal and external noise levels, and ample luggage space.
7. Design of transit cars and station platforms must make possible quick loading and unloading of passengers for the trains will remain at the stations for a 20-second maximum stop.
8. The stations must be conveniently located; all the structures of the system must be pleasing in appearance.
9. Fare collection must be both practical and convenient.

Here's The "Jeep" You Asked For!



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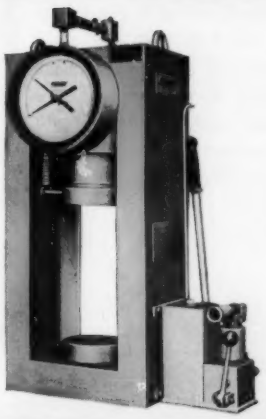

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Constant wattage — 100-130/200-260 V.
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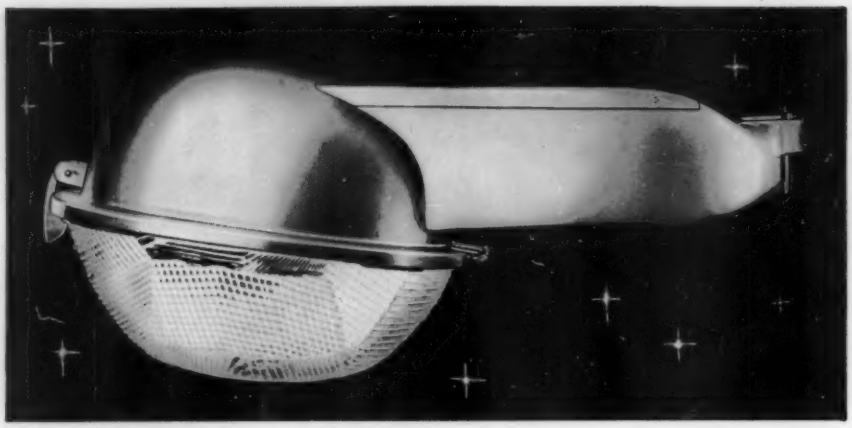
Reactor type — 240 V.

Available with NEMA standard twist lock adapter for photoelectric control. For 2" end mounting, or 1¼" mounting by using spacer clamp.

Request Bulletin 124 for specifications and construction details.



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Available with NEMA standard twist lock adapter for photoelectric control. For 1¼" or 2" end mounting.

Performance curves on this and Style 69 on application.

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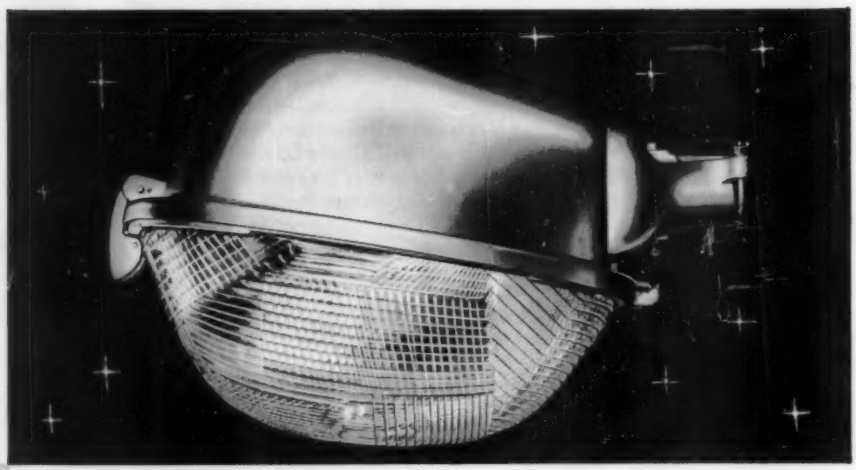

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The City Tells Its Story

Edited by PAN DODD EIMON
Consultant, Municipal Public Relations

Municipal Public Relations

City managers east, west, north, south agree:

Successful City Reports Must Be Well Planned

"You can't snap your fingers the first of March and expect to get out a good report the first of April." Heads nodded in agreement to this remark of City Manager Ralph Snyder, Highland Park, Ill., made at the 45th Annual Conference, International City Managers' Association, in St. Louis last month. The subject was annual and special reports. The occasion was one of four workshops on public relations techniques held during the conference.

City managers questioned neither the validity nor the necessity of reporting to citizens. They said, in a number of different ways, that the report has values for city administrators, city councilmen, department heads and city employees as well as the citizens.

But the city managers are trying to find out just what format people will read and heed. Change of pace, most believe, heightens reader-interest. So the city that has issued booklet reports changes to a newspaper style. And the city which has reported via the newspaper turns to colored slides. Managers with long experience in reporting annually may step up the schedule to four times a year. The managers told one another, "Don't stick to one format forever. Better no comment at all than 'Oh, the city report, I saw *that* one last year'."

Robert Mitchell of Sharpsville, Pa., and PR panel Chairman Donald H. Blatt, West Hartford, Conn., boosted reports in the newspaper format. "The booklet-style can be beautiful and hard to beat in a report competition," Manager Blatt admitted. "But the newspaper format costs less, is an excellent vehicle for telling the city's story, and is appreciated by citizens—both for easy reading and because it obviously isn't too expensive."

Kendall Lee, Asbury Park, N. J., says his city has sharpened citizen interest by making four reports a year instead of the one it formerly issued. "We get comments after every issue," he told questioners who asked how to evaluate citizen interest, "sometimes more than we really want!"

Peter F. Lydens, assistant city manager of Winston-Salem, N. C., spoke up for reports via colored slides which his city is using. Winston-Salem's report has a taped commentary and is shown to any group requesting it.

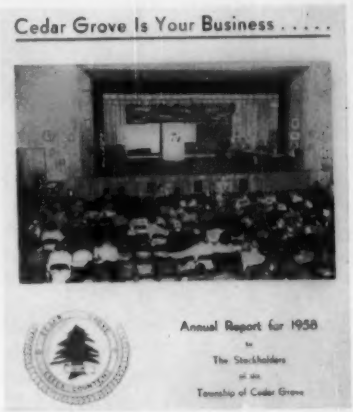
Managers agreed with panelist Thomas E. Chenoweth, St. Louis Park, Minn., that, "Appearance of the report is strategically important." He said he "took advantage of PR people in town for professional assistance with illustrations, layout, and general design." He's found them "more than willing to donate their talents to the city."

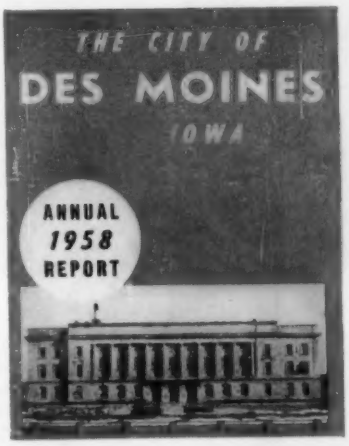
City managers favor taking bids from local printers. In this way, H. R. Bennett of Burbank, Calif., can produce a two-color, 16-page, 11" by 8½" report, illustrated with line drawings and photographs for 8½¢! Burbank prints and distributes 40,000 copies. The total bill is $3,400.

Manager Chenoweth's St. Louis Park report, 16 pages plus cover, is in two colors, profusely illustrated, 4½" by 8½" in size, and it costs just a fraction over nine cents a copy. The cost for 14,000 copies is $1,350.

Manager Blatt of West Hartford thinks his town's tabloid newspaper report is the bargain of them all. The cost is under six cents a copy including mailing to each householder. Eighteen thousand copies were sent out for a total cost of $1,022.20.

This year, the West Hartford report was printed by the newspaper





Modern lighting for America's most famous Main Street

Business section of Sauk Centre, Minnesota.
Photo by courtesy of *Town Journal*

LIVELY AND BRIGHT is the business section of Sauk Centre, Minnesota. This typical American' town, made famous in the novel "Main Street" by Sinclair Lewis, chose Millerbernd "Elite' lighting standards for its renowned thorofare.

Here they needed a lighting standard that would be simple to install and to maintain, with the strength that only *cold-roll-formed*, high-strength steel could give. They *wanted* styling that would be distinctively modern so citizens and visitors alike would say "here is a progressive city".

The seventy-three "Elite" standards installed here will prove, *in the years to come*, as now, to have been a wise choice.

Our booklet OTA is filled with ideas to help you with *your* lighting project. Why not get your copy? Write: **Millerbernd Manufacturing Co., Winsted, Minnesota**

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LIGHTING STANDARDS

but the report was a separate and complete newspaper in itself. Last year the report cost a few dollars less when carried as part of the regular newspaper. But Mr. Blatt thinks that there was considerable more prestige value in sending the report out alone and that distribution was more thorough. Here is a cost breakdown in the most recent (1958-59) West Hartford report:

Photos	**$ 36.00**
Postage (including a permit)	**410.00**
Printing (by newspaper)	**495.00**
Addressograph, etc.	**81.20**
Total	**$1,022.20**

These Reports Have Something Special

Burbank, Calif. It's issued in 1959 so Burbank calls it a "progress report for 1959" rather than have it out-of-date with the more usual "report for 1958."

Norfolk, Va. Introduction of a new city symbol: Mr. Mace (see illustration at right), a caricature of the mace presented to the city in 1754 and believed to be the only ancient symbol of its kind in the U. S. Also noteworthy: eyecatching layout, photographs, and color. The best newspaper report we've seen this year.

West Hartford, Conn. A calendar of municipal events for the year ahead centers the reference page which contains the most-used city phone numbers, names of all members of the boards and commissions.

Richmond, Va. Story-telling pictures (no lined-up police officers staring out of this report!) Police officers are doing something. The "something," incidentally, is hosting a three-day open house with demonstrations of on-the-job techniques. Twelve thousand Richmonders saw the show.

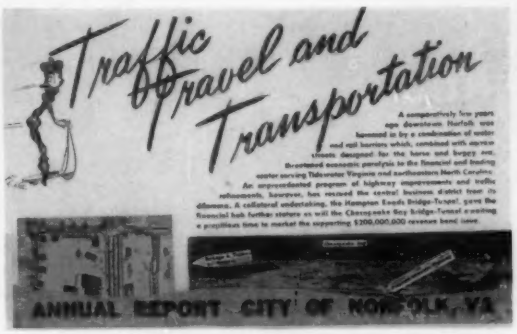
Tacoma, Wash. Fine grade enamel paper for this report although it is a section of the *Sunday News Tribune*. Some officials like the newspaper format but do not like shoddy newsprint for an annual report. Tacoma has an answer for this objection.

Sioux City, Iowa. This report has the best title that's come to us this year: "Of People and Purpose."

LaMesa, Calif. Compact, handsome in size and presentation. This is the finest small, inexpensive report received.

Hollywood, Fla. The ultimate in uniqueness. This is a "Tale of Two Cities" (Hollywood before and after the hurricane of 1926). Walt Disney charges money to produce and market this kind of thing . . . Hollywood, Fla., sends it to citizens free! In full color with drawings and unusual layout. Certain to be read and remembered.

Lawrence, Kans. Top grade for the note to citizens, page one of this tabloid which appeared as part of the *Lawrence Daily Journal-World*.



How the City of Des Moines Does It

This year marked the start of a "new era of reporting" for the people of Des Moines, Iowa.

Annual reports, in previous years, were run off on city printing equipment without much care for appearance and layout appeal. The reports were distributed to a limited 2,000 persons and places.

In 1959, City Manager Elder Gunter—with the backing of Mayor Charles F. Iles—put out a slickly-printed, fully-illustrated booklet. Distribution was quadrupled (to 8,000). And, next year, even more of Des Moines' householders will get the report. (There are 212,000 people in the city, an estimated 50,000 to 60,000 households.)

Manager Gunter, who came to Des Moines in late 1958 from University City, Mo., and a long tradition of handsome annual reporting, has other ideas too. In 1960, in addition to the booklet-type annual report, the city will issue a 35-millimeter color slide report.

In a nutshell, here's pertinent data on the last Des Moines booklet report (1958-59):

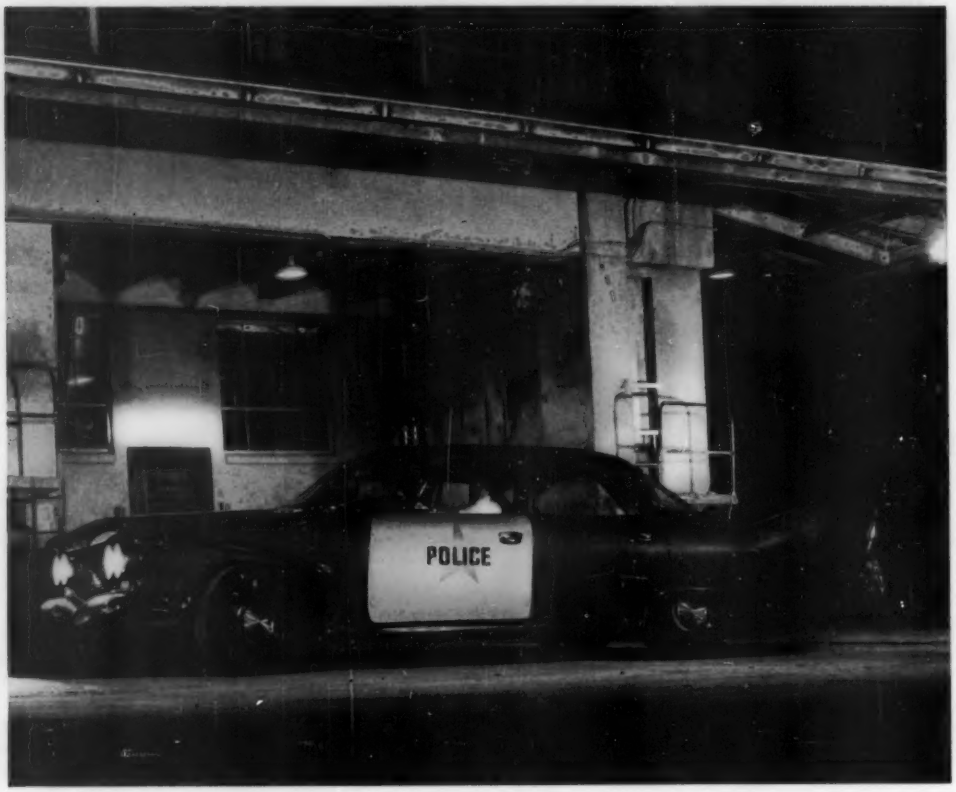
- **Size is 6" by 9", 44 pages plus cover.**
- **Enamel paper, printed in black with a second color.**
- **Illustrated with drawings, charts, and photographs.**
- **The report was made by the manager to the mayor and council and, in turn, by the mayor and council to citizens.**
- **The report was distributed to civic, fraternal, and business groups; to members of all city-affiliated boards or organizations; to libraries, the art center, city hall and other public gathering places; and is mailed to individual citizens, on request.**
- **Cost of the report was $2,300 for 8,000 copies—about 29c each.**
- **Reaction to the report: "The City of Des Moines 1958 annual report is one of the most concise and informative publications available to the citizenry." The report is "especially valuable for the nearly 2,000 new residents of the city each year." The booklet's "44 pages answer most of the questions (of citizens)." It "gives them an excellent general knowledge of the city and its function and operation."**

1959 Annual Index

Bound into the back section of this issue of "The American City" is the 1959 Annual Index, arranged according to subject and place.

A limited number of the reports mentioned in these pages are available to city officials. Write directly to the Office of the City Manager, City Hall, city and state mentioned.

There are three Solid Plymouth '60 Police Cars. Each one is built special for the job it has to do. Each one is beefed up where beefing up is needed. These hot performers give good fuel economy.



For city work, there's Plymouth's Patroller 6 with a new inclined 30-D Economy Six Engine—145 horsepower at 4000 RPM. The Patroller 6 engine is ideal for city police because it delivers top gas economy in stop-and-go driving, rivaling sixes with 30 to 70 less horsepower. It is also the best performing six in its class. It uses regular fuel.

For both city and suburban use, there's Plymouth's Patroller Special 8. It's powered by the new Fury V-800. Big, rugged, this engine develops 230 horsepower. The Patroller 8 has lightning-like acceleration, yet it is very easy riding and feather-light to handle.

For highway and turnpike patrol, Plymouth offers the Pursuit Special 8. It is perhaps the fastest Police Car on any highway. This Pursuit Special 8 corners level and is unusually stable even in severe crosswinds. Its brute of an engine—the Golden Commando 395 V-8—develops 305 horsepower at 4800 RPM. Torque is 395 lbs.-ft. at 3000 RPM.

Each of these Solid Plymouth Police Cars also has many things that police everywhere have been demanding. There are sturdier, longer-lasting bodies; fast-stopping, oversized brakes with linings that won't wear out quickly; manual and automatic transmissions that are tough enough to stand up in police work and more room inside than ever before.

Interested? See your nearest Plymouth dealer today. Ask him for a free copy of the new Plymouth Police Car Catalog. It's full of information. There's no obligation at all.

A CHRYSLER-ENGINEERED PRODUCT, BUILT A NEW SOLID WAY TO GIVE YOU SOLID SATISFACTION.

SOLID PLYMOUTH 1960

From Rubber Bands to Road Graders

Arthur J. Rommel

By **ARTHUR J. ROMMEL**
Purchasing Aide
Council Bluffs, Iowa

One hundred years ago on August 19, 1859, Abe Lincoln paid a visit to the frontier town of Council Bluffs, Iowa. It was a memorable day for the people of this bustling little town with its board sidewalks, covered wagons passing down the dusty streets on their way westward, and a few merchants doing a thriving business.

Since that day, Council Bluffs has grown to a city of over 50,000 population, and of course many changes have taken place.

In the not too distant future, Council Bluffs will be a hub on the great interstate highway network, with a three-level freeway in the western section of the city, which will link Council Bluffs with a new bridge to be built north of the present bridge to Omaha. Another bridge, to be built later, will cross the Missouri River to South Omaha, Offutt Field (the home of Strategic Air Command), and the stockyards.

Our city has the manager form of government and it has carried on a very progressive program for the development of the city. Since the eastern part of the city is hilly terrain and the western part is flat, the city is faced with continuous drainage problems. Large storm and sanitary sewer lines have been constructed to take care of this problem. Since 1952, over one-half million dollars have been spent on new sewers, and 261 blocks of new concrete pavement have been laid, and 141 blocks of street re-surfacing.

Under our city manager form of government, the city manager is head of the Purchasing Department in addition to his other administrative duties; however, the Purchasing Department's main functions, such as the issuance of purchase orders, preparing specifications, legal notices, and bid proposal forms, are the responsibility of the Purchasing Aide. All budgetary items for all city departments are purchased either by phone or letter or, in the case of the larger purchases, by bid. Any purchase over $1,000 requires the signature of the city manager on the purchase order. Our purchases, we like to say, cover "everything from rubber bands to road graders." No purchase orders are issued without a requisition from the department involved and each one must be approved by the finance director.

Equipment

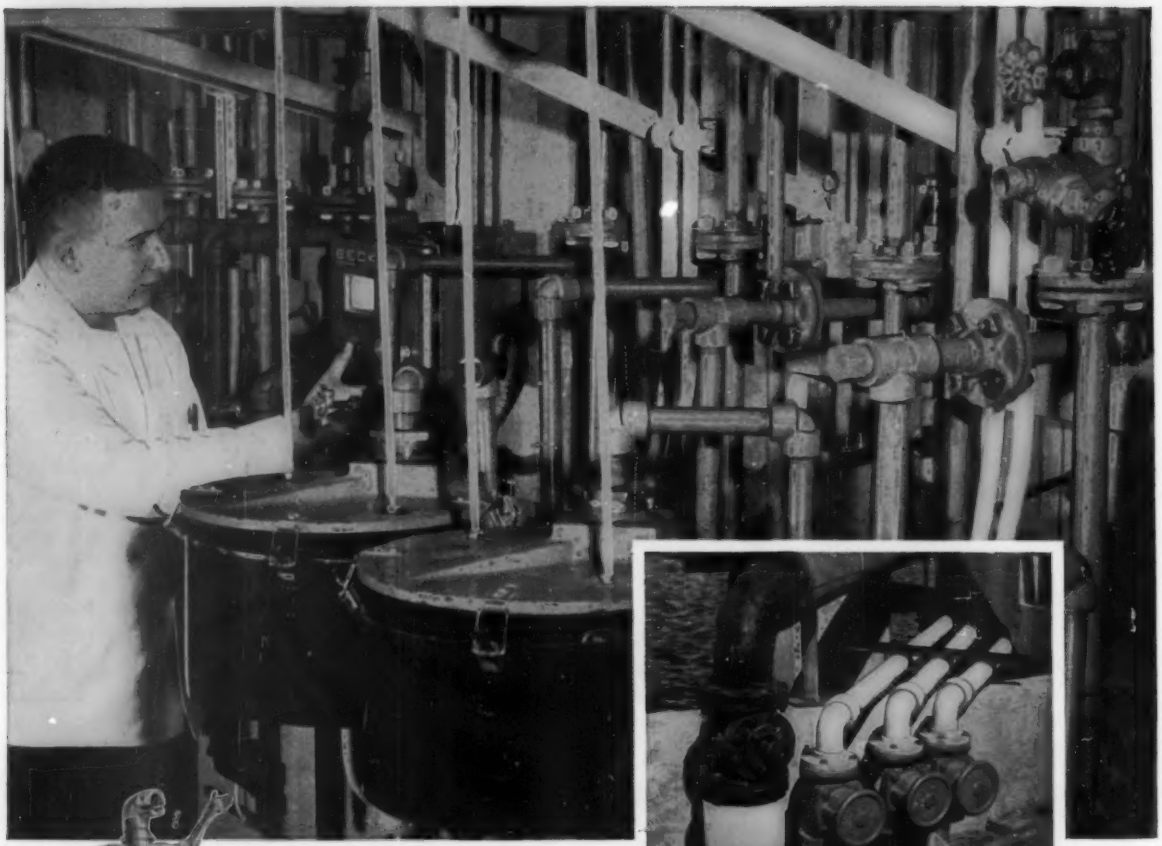
The city owns and operates 102 pieces of equipment of various kinds, the latest addition being a Cushman Truckster used by service men in the meter department. It is the challenge of each new day and the different and varied problems that day brings which give interest and pleasure to our purchasing work. Friendly cooperation with all city departments and honest dealings with suppliers are the keys to our success.

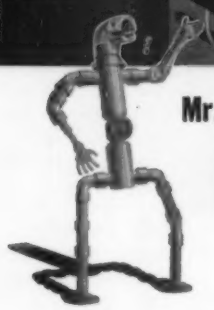
Twice each year, we accept bids for about 90 items in our Revolving Fund. For instance, we will purchase 50 reams of letter and legal size bond paper, 50 reams of onionskin paper, 150 reams of mimeograph paper, pencils, erasers, ball point pens and refills, ink in quarts and pints, file folders, manuscript covers, index tabs, desk blotters, hand soap, iodine, gauze, band-aids, and many more items.

All of these items are kept in a locked room, properly displayed on shelves. A running inventory is kept on this stock. Withdrawals are made by the personnel of various city departments through the purchasing department and a charge-out record is kept. At the end of the month a requisition is issued by each department head for all items received during the month. A purchase order is likewise written and attached to the requisition, listing items issued. This purchase order is then forwarded to the finance department and handled in the same manner as any other purchase order. We charge the departments the bid price at which all items were purchased, and in effect, bring about a substantial savings to all departments.

No one has access to the revolving fund stock except purchasing department personnel. And incidentally, we have never experienced any shortages. This is another way of saving money for the city by quantity buying and passing the savings on to each department. Not only do we save the departments money but we cut down on issuance of requisitions and purchase orders for individual purchases, made now through the department.

USCOLITE PLASTIC PIPE





Mr. Usco reports:

After 5 years, all 8 miles of Uscolite still perform perfectly

The Omaha, Neb., Waterworks formerly used metal pipe to introduce strong chemicals into the water to purify it. But the corrosive fluids ate the metal pipe, requiring pipe replacement about twice a month. Then, "U.S." plastic engineers suggested sampling a piece of ½" Uscolite® plastic pipe.

"We were so pleased and amazed at Uscolite's performance," said a Waterworks executive, "that we quickly ordered it in various sizes for a total length of 43,000 feet. That was over 5 years ago, and today, the Uscolite pipe shows *absolutely no sign of deterioration*. The savings in money and maintenance are tremendous."

Uscolite is deliberately engineered to handle highly corrosive fluids. It is extremely light in weight, yet has high impact strength. It imparts neither taste, odor, nor discoloration. The Uscolite line of pipe, valves and fittings is the most comprehensive plastic pipe line in America and has been awarded the National Sanitation Foundation Seal of Approval.

• • •

When you think of plastic, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality plastic pipe and fittings.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Collinsville's new water plant provides ample amounts of clear, soft water. Present capacity is 5 mgd.

Our Long Range Plans Pay Off

. . . in clean water, higher pressures, more capacity and fewer complaints

By **H. B. WIESE**
Supt. of Public Works
Collinsville, Ill.

Once an improvement is made people often wonder how they got along with or tolerated former conditions. The surprising thing, especially in the field of water, is the slight difference in cost between good and mediocre service. We found that a 33% increase in rates provided sufficient funds not only to correct certain problems immediately but also to carry out a long range program designed to upgrade the entire water system of the city.

In a nutshell, low pressures, poor fire protection and "dirty water" constituted our main problems. Our water, from deep wells, is cool and refreshing—but it contains iron, manganese and carbon dioxide—and it is hard. Through the years the iron and manganese precipitated in the mains, leaving heavy deposits of a dark, gelatinous substance. These deposits restricted flow and frequently broke loose, causing "dirty water."

To make matters worse, distribution lines were expanded to accommodate day-to-day needs, resulting in thousands of feet of undersized mains. Some of these mains consisted of galvanized iron pipe which soon corroded and developed numerous leaks.

In 1956 Mayor Delbartes and the Common Council faced the issue squarely, engaged the St. Louis engineering firm of Stevens, Lopinot and Weber, and instructed them to make a thorough study with recommendations as to the scope, schedule and cost of improvements needed to correct immediate problems, bring the entire system up to date, and allow for future needs. The next step was the appointment of a citizens' advisory committee to explore the potentialities of financing the program. Also, the engi-

For economy reasons, the four filters were left open; the well-water supply eliminates the problem of freezing.

Filter controls are pneumatic. Space is provided for the addition of four more consoles as needed.

John Parris, *Manager Centrifugal Compressor Sales, and* John Fullemann, *Chief Turboproduct Design Engineer, The Cooper-Bessemer Corporation, discuss...*

How Cooper-Bessemer blowers assure dependable sewage aeration

The four Cooper-Bessemer Centrifugal Blowers shown above supply air for sewage aeration at the addition to the sewage treatment plant of Washington, D. C. This modern plant, designed by Greeley and Hansen, Consulting Engineers, Chicago, will handle 290 mgd and serve a population of 1,500,000.

The four Cooper-Bessemer blowers have a total capacity of 160,000 cfm, sufficient to supply 0.8 cu. ft. per gallon of sewage. Continuous, 24-hour operation demands utmost *reliability* of the equipment. This is assured by features such as the impeller of Carilloy T-1, shown above.

It will pay you to have Cooper-Bessemer Blowers, Engines, Compressors and En-Tronic® Controls on *your* sewage treatment facilities. Call us for help in the planning stage.

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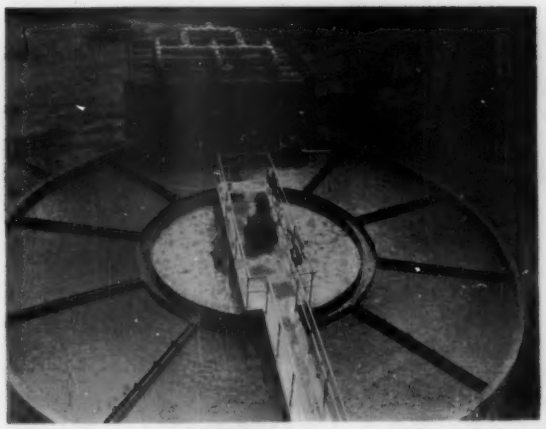
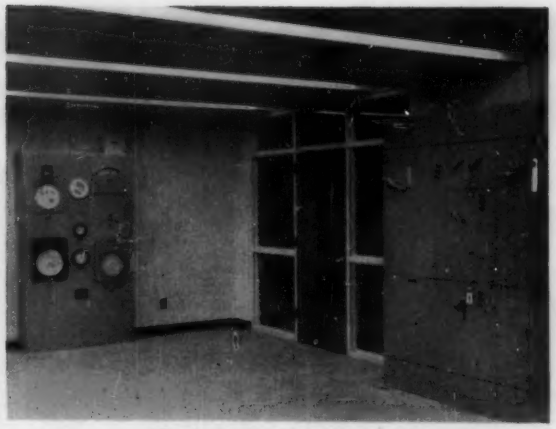


The aerator and upflow basin remove many undesirable qualities of the water and also soften it.



The instrument and electrical panels are in the same room as the filter consoles, providing plant control in one small area.

neers prepared a valuation of existing facilities, a comprehensive breakdown of past revenues and operating expenses and anticipated revenues and operating expenses.

The advisory committee found that a slight increase in water rates would provide sufficient funds to carry a $625,000 bond issue, which, along with cash reserves, would pay for needed improvements. These improvements would cost an estimated $688,000.

In March 1957 the city awarded contracts for distribution system improvements and treatment facilities to remove the iron and manganese and also soften the water. One year later another contract was awarded for construction of a well to supplement the three existing wells. In addition, the existing wells were modified to provide higher pumping heads.

Plant Constructed

The new 5-mgd treatment plant provides aeration, flocculation, sedimentation and filtration. As water flows from the wells to the coke tray aerator, it passes through a flow meter that indicates, records and totalizes raw water flow. This same instrument controls the feed rate of alum, lime and chlorine. Removal of iron, manganese and hardness takes place in an upflow type basin. Following recarbonation, the water passes through the filters and into the plant clearwell. The filter consoles, pneumatic in operation, provide filter control and indication of rate-of-flow and loss-of-head and wash-water-rise rate.

The new 1500-gpm Jacuzzi high service pump and the 800-gpm, 900-gpm, and 1600-gpm Dayton Dowd horizontal centrifugal units which were moved from the old plant, discharge into two headers that connect to the distribution system. Each header contains a flow meter which transmits a signal to the totalizer controlling the indicating, totalizing and recording instrument on the main instrument panel. We also have a 6500-gpm Jacuzzi pump for backflushing purposes.

Infilco, Incorporated provided the basic treatment facilities — aerator, accelator, oil-fired recarbonators, alum feeder, lime slaker and filter controls. Wallace and Tiernan supplied the chlorinator and gravimetric lime feeder. All well pumps are Fairbanks-Morse units.

Central Control

A master control room, containing filter consoles, instrument panel and electrical panel provides basic control of all plant functions. Besides the instruments already mentioned, the main panel includes a vacuum gauge showing prime of the centrifugal pumps, a main pressure gauge, an indicator-recorder showing water level in the elevated tank, a clearwell water level indicator and warning lights and bells for critical control items that it is necessary to keep under surveillance.

Hercules gasoline engines serve as standby units on two wells and two high service pumps. For standby electric power at the plant we utilized an old diesel generator set large enough to take care of plant lighting, instruments and all small motors used in basic plant functions, should the need arise at any time.

Currently we dispose of plant wastes in lagoons but an anticipated sewage treatment plant will replace the lagoons in the future.

Distribution system improvements included the installation of 375 feet of 16-inch, 1425 feet of 14-inch, 10,160 feet of 12-inch, 2460 feet of 10-inch, 1300 feet of 8-inch and 490 feet of 6-inch cast-iron pipe. Also included were 15 fire hydrants and numerous valves and fittings.

Success

The results and success of the program are expressed in many ways. In the distribution system flows were boosted from five to seven fold while maintaining adequate residual pressures in the mains of 25 to 40 psi. Also approximately 12,000 feet of water mains have been constructed in subdivisions conforming to the master plan for development of the distribution system.

For months prior to placing the new plant into service, we chlorinated the water to dissolve the gelatinous deposits. This procedure proved effective and since the plant was placed into service only a few scattered occurrences of "dirty water" have been reported. Besides clean, soft water, we also have ample capacity for peak demands and fire protection for the 17,000 residents of Collinsville. In addition, the plant can be readily expanded as the demands of the future require.

Contractors for the construction were Crow Contracting Company of St. Louis, for the mains; General Contracting Company, Inc., and Walter F. Fischer of Collinsville as a joint venture for the plant; and Luhr Bros., Inc., of Columbia, Illinois for the wells.

Progressive Jefferson Parish, La. Reports on New Container System

Schools and Other Public Buildings Are Served By 18 Yd. DUMPMASTER

Jefferson Parish, La.: In November of 1958, this progressive community installed an 18 cu. yd. DEMPSTER-DUMPMASTER and put 24 three cu. yd. steel containers into service, as the first step in streamlining refuse collection in the parish.

Commissioner Ray Conden and Assistant Director Ray Patron are shown in front of the Dumpmaster.

Because of climatic conditions, storage of refuse has always posed a sanitation problem in this area. Ten months ago, under the leadership of Sanitation Commissioner Ray Conden and Assistant Director Ray Patron, the first portion of a long-range plan was executed with the installation of the new system.

Commissioner Conden directed that the schools receive the first of the sanitary, fireproof containers. The service was then extended to other public buildings, until today, 38 containers are in service.

BEFORE: The yard of this parochial school was constantly littered with unsightly trash.

The DEMPSTER-DUMPMASTER prepares to dump its big payload of compacted refuse into the modern Jefferson Parish incinerator.

SCHOOL OFFICIALS PLEASED

Officials of both public and parochial schools have expressed delight with the enclosed storage of garbage and refuse. Many report a marked reduction of flies, rodents, odors and scattering of trash.

ECONOMY BIG FACTOR

"We are all aware of the many sanitary values of enclosed refuse storage, which is the primary reason for purchasing this type of system," Director Ray Patron pointed out, "but our cost sheets — based on several months of operation — prove that we are saving important amounts of money.

AFTER: Two three-yard Dumpmaster containers keep refuse enclosed, reduce flies, rodents and odors.

"The savings in time, money and manpower have enabled us to direct more effort to the important area of residential collection; I am convinced this addition to our service has resulted in specific benefits to every man, woman and child in the parish, while saving tax dollars."

DAILY SERVICE

Most of the 38 locations receive daily service as the DEMPSTER-DUMPMASTER makes its rounds, mechanically picking up each container, dumping the contents into its body and hydraulically compacting the refuse. The refuse is then emptied into the modern Jefferson Parish incinerator for disposal.

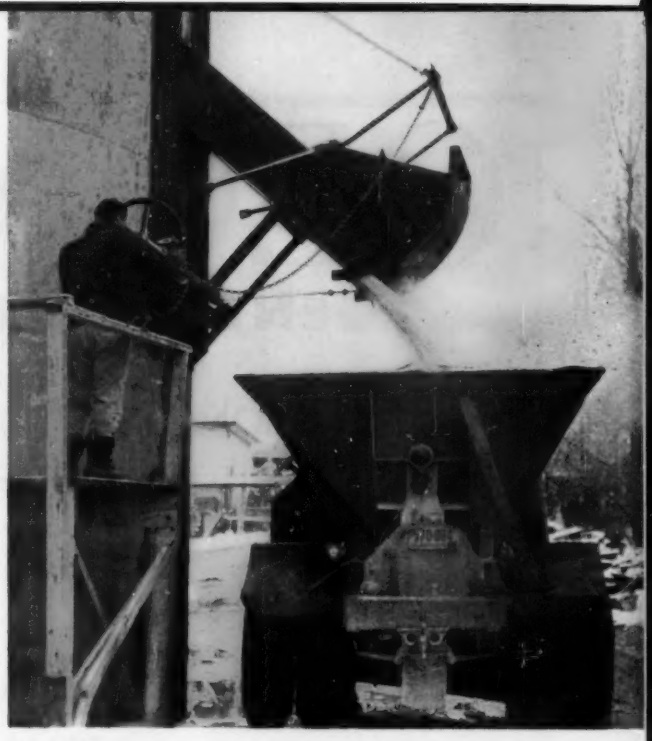
The Dumpmaster has proven itself in countless cities, large and small. If you would like the new brochure that describes this economical system, write today.

Patents Pending

DEMPSTER DUMPSTER® SYSTEMS

DEMPSTER BROTHERS
Inc.
Knoxville 17, Tenn., Dept. AC-12

Last winter Syracuse tried flake salt with success. Here a load is dumped into a pit for tranfer to a rented coal elevator by crane.



Flake salt is loaded into a Humphry salt spreader mounted on a Walter truck. The elevator keeps the material dry and permits gravity loading.

Syracuse Keeps Winter Traffic Moving

By **CHARLES J. McPHAIL,** Commissioner of Public Works*

Public works department organization during winter months in the City of Syracuse is primarily based on one big job, getting rid of ice and snow as fast as it comes—and we get plenty of it. The following table shows our snowfall record for the past two winters:

1957	November	5.0 inches
	December	13.5 inches
1958	January	36.6 inches
	February	72.6 inches
	March	12.5 inches
	November	22.1 inches
	December	22.5 inches
1959	January	48.8 inches
	February	17.8 inches
	March	26.0 inches

Consequently, during the winter months we are organized as follows:

Weekdays: 7 A.M.-3 P.M. shift—24 crews for salt or plowing; 3 P.M.-11 P.M. shift—four emergency salt crews; and 11 P.M.-7 A.M. shift—11 crews for salt or plowing.

Weekends: Three shifts—composed of four crews, one foreman and one crane operator.

Our men are on a call basis all winter, so we can call in additional crews as a situation develops.

Parked cars offer the biggest obstacle to good snow plowing on city streets. To ease this problem, the city prohibits parking on the streets in the central business district from 12 midnight to 7 A.M. This allows our forces to move into the area during the night and have it cleared by morning.

Parking outside the central business district is allowed on an alternating basis between the hours of midnight and 7 A.M. On even days preceding-midnight parking is per-

Syracuse practices the "dry pavement" formula. Here salt has already started to melt the snow. Note parking on one side only.

* Mr. McPhail was appointed Commissioner of Public Works in 1958 and serves as Chairman of the Mayor's Operations Committee, controlling liaison between the Mayor's Office, his Executive Committee and the various municipal departments. He also serves on the Onondaga Public Works Commission of Onondaga County and is Chief of Engineering and Public Works Service in Civil Defense for Syracuse and Onondaga County.

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- DESTRUCTION OF ODORS IN SEWAGE HANDLING
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- ODOR CONTROL IN PUBLIC BUILDINGS AND MEETING ROOMS

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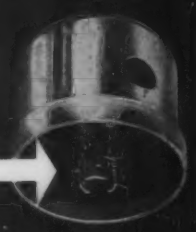
"FLASHOVER" ELIMINATED

MODEL 5940 TUBELESS

EXCLUSIVE TERMINAL ISOLATION DESIGN



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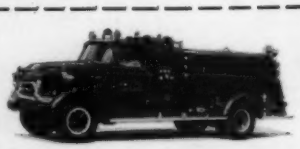

mitted on the even side of the street; on odd days preceding-midnight parking is permitted on the odd side of the street.

On selected narrow and congested streets we erected signs reading: "24-hour parking—even days of the month—starts 8:30 A.M." On the odd side of the street the signs read "odd days." We started posting certain streets in 1958 and we have since found it was a great success.

Posting the streets in this manner makes it necessary to plow these streets on two successive days. However, before this system was adopted, cars parked on both sides of the narrow streets made it impossible for plows to pass through at all.

We set up six special routes so that six plows can go back the second day, after the cars have moved to the other side of the street, and curb the snow where cars were parked the preceding day. This system allows us to do a better job than we could possibly have done before.

All told, we have 22 plow routes. The dispatcher gives each driver a route sheet before he leaves the garage, with instructions to plow the streets in the order listed on the sheet. Main arteries top the list, followed by bus routes, problem hills, and finally residential streets. We have 400 miles of streets and our plow mileage amounts to 1404.5 miles.

Ice Control

Rock salt is the mainstay of our ice-control operation, and during the severe winter of 1957-1958 we used 9,800 tons of the material. Our 35 ice-control routes cover 153.7 miles of grades and critical intersections, with actual ice-control route mileage reaching a total of 638.9 miles.

For this work we used 11 large box-type salt spreaders and 18 Tarco Scotchman spreaders mounted on dump trucks. This past summer we added to our large box-spreader fleet by purchasing four Shunk units.

This past winter we experimented with a manufactured flake sodium chloride made by Solvay Process Division of Allied Chemical and Dye Corporation. We have high hopes for this product, because it is $2.79 per ton cheaper than the delivered price of the mined rock salt we use and $4.29 per ton cheaper if we pick it up at the plant—which is located close at hand just outside of the city. Last winter we used 4,672 tons

Special parking restrictions on narrow streets permit plowing where previously such work was impossible.

of flake salt and 8,214 tons of rock salt.

Results obtained with this flake salt are satisfactory but it must be stored under cover. We solved this problem by renting a coal yard elevator and loading our trucks by gravity chute. The coal elevator keeps the salt under cover and in good condition for use. Rock salt is stored in our own yard.

Our practice is to treat snowfalls not exceeding 2-3 inches as an ice-control problem. Main streets and hills are cleared of snow and ice by the use of salt. The public expects dry pavements and that is what we give them.

Plowing operations start when over 3 inches of snow accumulates. As soon as the main arteries are cleared, the salt spreaders go out to melt off any snow remaining on the pavement.

We remove snow from the central business district at night, using regular snow loaders, front-end loaders and large dump trucks. It is dumped in Onondaga Creek, which is nearby. Several bridges are equipped with swinging guard rails and truck stops for this purpose. However, it takes a relatively heavy snowfall to make snow removal necessary, for we use enough salt in the central business district to make most of the snow "disappear."

GOLDAK TRANSISTORIZED LOCATORS

Pipe Locator-Leak Detector

"Dualtronic"

Model LC-5T

The new "Dualtronic" combines the finest transistorized Pipe Locator ever developed with a high-gain Leak Detector to produce an effective and useful multi-purpose instrument. Designed specifically for Municipalities and Water Companies, the LC-5T assures pin-point detection of pipes, cables, mains and laterals and becomes a sensitive detector for water leaks simply by plugging in a crystal, rubber-encased microphone. Additionally, by a simple manipulation the new "Dualtronic" will pin-point valves, risers, boxes, and manhole covers. Now with transistors the versatile LC-5T is lighter, more sensitive, easier to operate, and it requires only flashlight batteries . . . Write today for further details on the "Dualtronic" and other Utility detection Instruments.

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Leading Electronic Manufacturers
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WORLD'S FINEST DETECTION EQUIPMENT MANUFACTURERS SINCE 1933

For LOW-COST OUTDOOR LIGHTING!

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MALLEABLE IRON METAL-PIPE POLE BASE

A Rugged Support for Threaded Pipe Uprights With Chamber for Splicing and Grounding.

Turn galvanized pipe into threaded hub of galvanized base. Top off with fixture. Install over embedded anchor bolts and conduit stubs. Splice and ground through hand-hole. Four sizes: 2", 2½", 3", 4". Plain or 3-pole receptacle cover. Bulletin #25.

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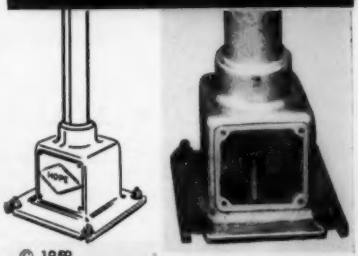

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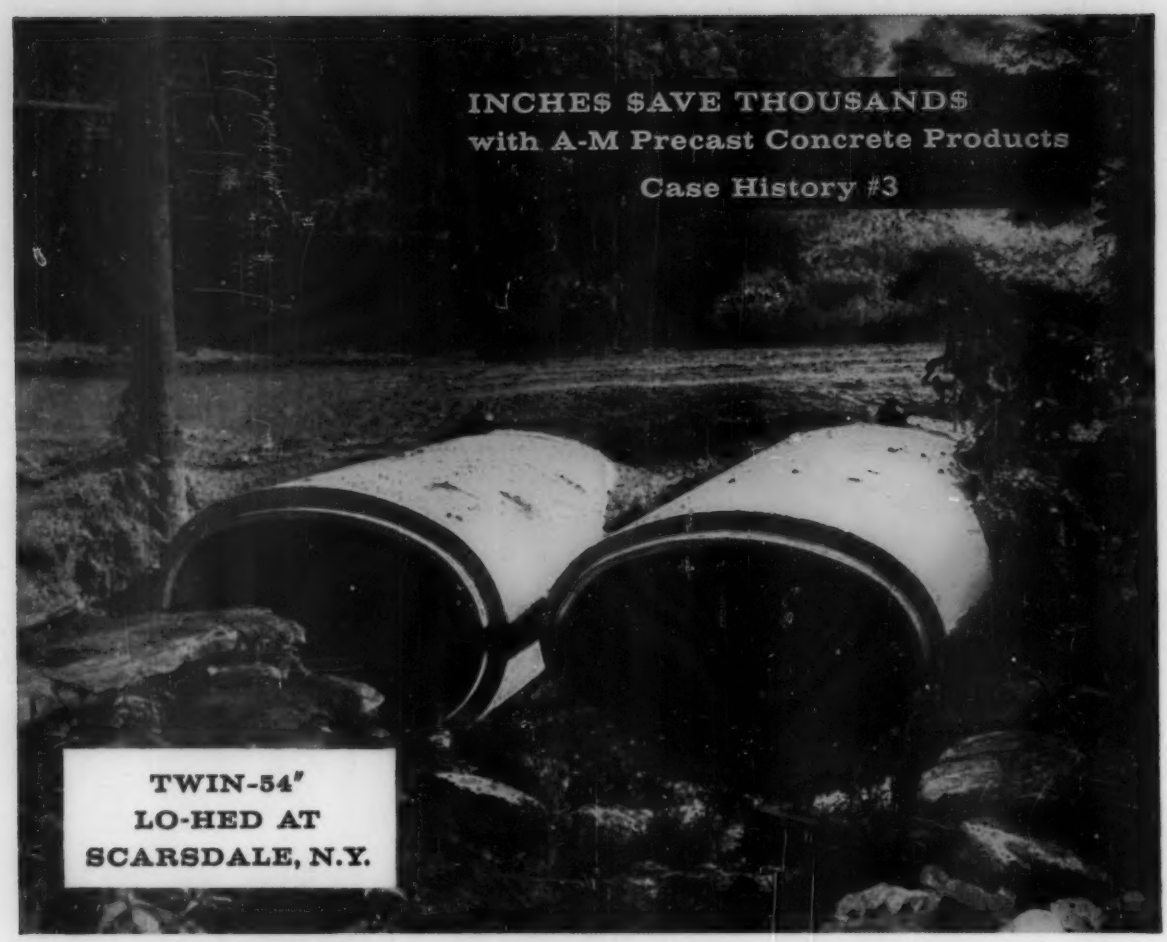
HOPE ELECTRICAL PRODUCTS CO.

53 Long Ave., Hillside, N. J., ELizabeth 4-7837



LO-HED CUTS CULVERT COSTS 3 WAYS

- **INITIAL COST**—two Lo-Hed culverts carry more water than three round pipe lines of the same height—putting every square inch to best possible use.

- **CONSTRUCTION COST**—two Lo-Hed culverts require less excavation, handling and jointing than three or four round pipe lines.

- **MAINTENANCE COSTS**—two Lo-Hed culverts, each with larger unobstructed area, pass more debris, giving yearly bonuses in reduced maintenance.

AMERICAN-MARIETTA COMPANY
CONCRETE PRODUCTS DIVISION
GENERAL OFFICES:
AMERICAN-MARIETTA BUILDING
101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS, PHONE: WHITEHALL 4-5600

Modern Water Rates PART XII

The Air-Conditioning Factor

How air conditioners affect water requirements, and what charges and restrictions are currently being used to avoid uneconomical water use that they can generate

Water requirements for air conditioning represent one of those modern developments imposed on one of the oldest municipal services. When science developed the means of adjusting indoor environments to comfortable conditions, regardless of outside temperatures, it produced a problem for other scientists and engineers who have been charged with the responsibility of providing the vitally-necessary water supply.

Most large air conditioners use water to remove the heat from the air in a building. The simplest of these merely discharges the warmed water to the sewer. Moreover, the average water rate at one time encouraged this practice. This placed a great burden on the water supply, particularly during the warm-weather period. It was not always restricted to warm weather, however. The heat from a great number of crowded bodies in, for example, a department store, causes trouble even in cool weather.

To eliminate this uneconomic use of public water supplies, a growing number of cities are encouraging the use of cooling towers or other similar devices to remove the heat from the water and reuse it in their cooling system. Some do this by special adjustments in the rates; others by simple prohibitive regulations. For the past decade, waterworks men have been trying to encourage this by adjusting their rates and passing regulations favoring this reuse practice.

The savings in water is substantial, varying from 75% to 95% of the water required without conservation.

Probably the simplest method of encouraging the reuse of cooling water is the surcharge. Fargo, N. D., for example, places an additional charge for water used in each of the months of June through September. The charge is $2.50 per month for each ton of the rated capacity of the non-conserved air-conditioning equipment installed on each premise. The Omaha Metropolitan Utilities District makes a charge of $36 a ton a year on water-cooled air conditioners.

Kansas City, Mo. makes a somewhat more detailed surcharge, also during the months from June to September, inclusive. The charge is based on each ton of non-conserved refrigeration of air-conditioning equipment, as follows:

		Per ton of refrigeration
First	2,500 cu. ft.	$0.182
Next	2,000 " "	0.27
"	28,000 " "	
	per 100 cu. ft.	0.165
"	470,000 " "	
	per 100 cu. ft.	0.11
Excess		
	per 100 cu. ft.	0.09

Probably the easiest way to overcome this unnecessary use of water is a direct ban on non-conservation air conditioners. Fresno, Calif., for example, has passed an ordinance requiring all air-conditioning and refrigeration equipment of three tons capacity or more discharging water into the city sewerage system, to have water-conservation devices which will not require water for makeup purposes of more than 10% of the needs without the devices.

In Cape Girardeau, Mo., the Missouri Utilities Company also specifies the use of a cooling tower or similar equipment for all air-conditioning equipment exceeding three tons of capacity.

While the three-ton limit seems popular, cities do use other figures. Newburg, N. Y., sets its limit at five tons of refrigeration. Park Ridge, Ill., cuts the limit to one ton. The City of Elizabeth, N. J., requires conservation equipment of new units of 10 tons or more and on all other new air conditioners, restricts the discharge of water to no more than 1½ gallons per minute per ton of rated capacity.

Philadelphia requires all new air-conditioning units of five tons or more to have conservation devices. On air-conditioning units in use prior to the regulation, the city lifts the limit to ten tons.

York, Neb. reverses the trend by providing water at a slightly lower cost to encourage air-conditioning. However, the city raises the bi-monthly minimum charge from $2 to $12.60 for those using this type.

The charge selected and regulations adopted reflect the community's actual need for water. If it is one of those favored few with an abundant supply that can be provided at relatively low cost, then the need for regulation is slight. If, however, the water is hard to obtain, and costly to distribute, then a city is best served by doing all it can to reduce the peak demand for water that these non-conserving units create.

DANVILLE, VA.

Rates Per Month

Cubic Feet	*Per 100 Cubic Feet*
First 4,000	$0.20
Next 6,000	.18
" 20,000	.12
Excess	.06½

An additional 10% charge is added if bill is not paid within 10 days. Outside city limits, charges are 50% additional.

Minimum Monthly Charges

Meter Size (in inches)	*Charge*
⅝ or ¾	$0.90*
1	2.00
1½	3.00
2	5.00
3	10.00
4	20.00
6	40.00

*The charge is $0.90 on unsewered streets and $1.20 on sewered streets.

Typical Monthly Costs

Gallons	*Cubic Feet*		*Charge*
3,000	400	(Min.)	$0.90*
5,000	667		1.33
10,000	1,333		2.67

*On sewered streets, $1.20.

General Data

Population served	50,000
Miles of mains	163.26
Services (100% *metered*):	
Domestic	11,005
Commercial	1,020
Other	166
Supply—Surface	
Treatment—Rapid sand filtration, chlorination, pH adjustment, fluoridation	
Plant capacity	9 mgd
Average demand	4.32 mgd

Remarks

1. Utility provides service line to property only.

(Continued on page 161)

Installed in 1909 — — Springfield's steel main is still on the job

Things have changed in the waterworks field since '09. But, as the photo shows, even then they were using large-diameter steel pipe in Springfield, Massachusetts.

This 42-in. lockbar steel main carries water some 22,000 ft from Provin Mountain Reservoir in West Springfield across the Connecticut River and into the City. Now in its fiftieth year, it is expected to give many more years of service. And in a half-century it has required very little maintenance.

Another major line, of 54-in. and 48-in. welded steel, with riveted joints, was laid between the reservoir and the city in 1928-1929. It's described as "in excellent shape" today.

The most recent tests indicated the H & W flow coefficients to be 111 for the 1909 line, 140 for the 1928-1929 line, and 143 for another steel line laid in 1949. According to the Municipal Water Works: "These tests showed that steel lines with proper coatings will give very long life as far as carrying capacity is concerned."

Scores of old steel mains are still in service throughout the nation. By present-day standards they were crudely constructed, inadequately protected. If they could give fifty or more years of steady, reliable service, think what today's steel pipe can do—lined and coated with modern coal-tar enamel.

Make your next main a *steel* main. The Bethlehem sales office nearest you will gladly give you full details on the advantages of steel pipe.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor:
Bethlehem Steel Export Corporation

BETHLEHEM STEEL

2. Utility provides 75 feet of main per consumer.

3. The Danville Water, Gas and Electric Departments do not operate sewer services, but they do bill for them in the amount of 50% of the water bill.

4. In billing, Burroughs automatic equipment is used.

5. Rates were increased by 25% in January 1956. Water use was somewhat affected. A 33⅓% increase is being considered for January 1, 1960.

6. There is no charge for in-city fire protection. This service is not available outside this city.

HOWARD A. JOHNSON
Superintendent of Water Purification
Water, Gas and Electric Departments
Danville, Virginia.

GREENWOOD, MISS

Rates Per Month

Gallons	*Per 1000 Gallons*
First 5,000	$0.25
Next 10,000	.22
" 10,000	.17
" 175,000	.12
" 800,000	.08
Excess	.06

Minimum Monthly Charges

Meter Size (in inches)	*Charge*
¾ or less	$1.25
1	1.50
1½	3.00
2	5.00
3	10.00
4	16.00
6	33.00

Fire Protection

Fire Hydrants—
1½ inches or less .....$ 3.34 per annum
Fire Plugs—
over 1½ inches .....$13.33 per annum

Sprinkler Heads	*Annual Charge*
First 1,000	.05 each
Next 2,000	.015 each
" 2,000	.01 each
Additional	.005 each

Typical Monthly Costs

Gallons	*Cubic Feet*	*Charge*
3,000	400	(Min.) $1.25
5,000	667	" 1.25
10,000	1,333	2.35

General Data

Population served 22,000
Miles of mains 64½

Services	*Number*	*% Metered*
Domestic	4,800	100
Commercial	680	100
Other (private fire protection)	38	0

Supply—Deep wells
Treatment—Chlorine added
Plant capacity .....9.4 mgd
Average demand ..... 5 mgd

Remarks

1. Greenwood Utilities charges actual cost of labor and material for water tap from main to property line. Maintenance of service line from main to property line after installation is provided at no cost.

2. Greenwood Utilities pays 2/3 of cost of water main extensions, the City of Greenwood pays ⅓. The city receives its cost back in the form of special assessment per front foot.

3. Greenwood Utilities operates both water and sewer services.

4. Billing is done on a National Cash Register billing machine.

5. Water rates were last revised in 1949, when they were increased by varying amounts. Water use was not affected, and further adjustment is now needed.

RAYMOND H. WHITE
Commercial Manager
Greenwood Utilities Commission
Greenwood, Mississippi

JACKSON, MICH.

Rates Per Quarter

Cubic Feet	*Per 100 Cubic Feet*
First 30,000	$0.12
Excess	.06

Outside city limits rates for consumption are double, but the service charge (see below) remains the same.

Quarterly Minimum and Service Charges

Meter Size (in inches)	*Allowance (cubic feet)*	*Minimum Charge*	*Service Charge**
⅝	900	$ 2.88	$ 1.80
¾	1,500	3.90	2.10
1	2,400	5.40	2.55
1½	6,000	10.80	3.75
2	9,000	15.75	5.25
3	18,000	28.80	7.50
4	66,000	72.00	15.00
6**	50,000	45.00	8.50
8**	150,000	90.00	12.00
12**	200,000	110.00	20.00

* The service charge is included in the minimum.
** Monthly only.

Fire Protection

Automatic sprinkling systems and/or other unmetered fire service connections of lines which are directly connected to the City Water Distribution System are subject to the following "ready-to-serve" charges:

Connection Size (in inches)	*Annual Charge*
6 or under	$ 50.00
8	75.00
Over 8	100.00

Rates for fire protection are the same outside city limits.

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200	$3.24
15,000	2,000	4.20
30,000	4,000	6.60

General Data

Population served 56,000
Miles of mains 170

Services	*Number*	*% metered*
Domestic	14,000	100
Commercial	500	100
Other	40	50

Supply—Wells
Treatment—Chlorine, Fluoride, Phosphate
Plant capacity ..... 30 mgd
Average demand .....11.5 mgd

Remarks

1. Utility provides service line to property only.
2. Utility provides 30% of the cost of new main extensions.
3. Both water and sewer services are operated and billed for by the Jackson Water Department.
4. Burroughs Sensimatic billing equipment is used for automatic billing.
5. Water rates were increased in Jackson in 1953 and decreased in 1956. Water use was not affected, but further adjustment is needed.

J. M. ROGEVEN
Superintendent
Water Department
Jackson, Michigan

KALAMAZOO, MICH.

Rates Per Quarter

Cubic Feet	*Per 100 Cubic Feet*
First 10,000	$0.14
Next 490,000	.10
Excess	.06

Outside city limits, rates are 25% additional.

Quarterly Service Charge

Meter Size (in inches)	*Charge*
⅝	$2.50
¾	3.00
1	4.00
1½	7.50
2	10.00
3	16.00
4	25.00
6	50.00
8	80.00

Fire Protection

Hydrant rental charge $35 per hydrant per year

Sprinkler Systems

Meter Size (in inches)	*Quarterly Demand Charge*
4	$10.00
6	20.00
8	32.00

plus a commodity charge:

Cubic Feet	*Per 100 Cubic Feet*
First 1,000	$0.14
Excess	.28

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200	$4.18
15,000	2,000	5.30
30,000	4,000	8.10

General Data

Population served 90,000
Miles of mains 336
Services (100% *metered*): Total of 25,000
Supply—Wells
Treatment—Chlorine, fluoride, phosphate
Plant capacity ..... 35 mgd
Average demand ..... 13 mgd

Remarks

1. Utility provides service line to full length.
2. Utility provides approximately 50% of the cost of new main extensions.
3. Sewer services are not operated by the City Utility Department, but it bills for them along with the water charge.
4. Water rates were increased somewhat in 1958. Water use was not affected and further adjustment is needed.

AL SABO
Manager
City Utility Department
Kalamazoo, Michigan

LYNCHBURG, VA.

Rates Per Month

Cubic Feet	*Per 100 Cubic Feet*
First 600	(Min.) $2.80
Next 2,400	.513
" 7,000	.42
" 10,000	.294
" 20,000	.221
" 50,000	.152
Excess	.122

These charges include 9% utility tax. Outside users pay double the in-city rates, but utility tax is deducted.

Minimum Monthly Charges

Meter Size (in inches)	*Charge*
⅝	$2.80
1	3.00
1¼	4.00
1½	5.00
2	6.00
3	11.00
4	22.00
6	45.00

Fire Protection

The city pays the Water Department $24 annually for each fire hydrant. Private sprinkler connections are unmetered and not charged for.

Typical Monthly Costs

Gallons	*Cubic Feet*	*Charge*
3,000	400	(Min.) $2.80
5,000	667	3.14
10,000	1,333	6.56

General Data

Population served 59,000
Miles of mains 216
Services (100% *metered*):
Domestic 13,374
Commercial 856
Other 369
Supply—Surface
Treatment — Coagulation, sedimentation, and filtration
Plant capacity ..... 15 mgd
Average demand ..... 7.08 mgd

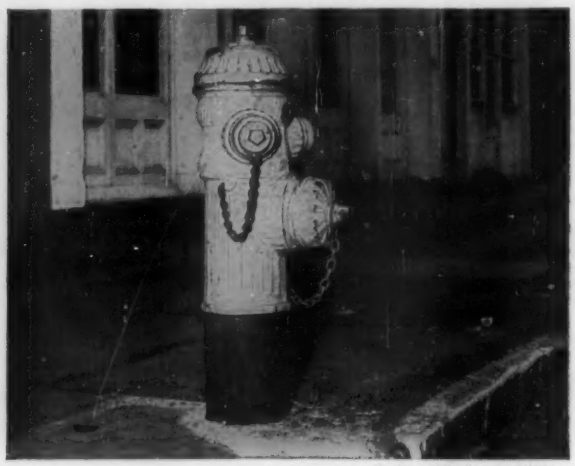
Remarks

1. Inside the city limits, the water de-

Aqueduct, 105 B. C.

Cathedral, 1065

Fountain, 1650



Ludlow Hydrant, 1883

SO WELL-MADE

they're still in use!

In a sense, Ludlow and Rensselaer fire hydrants are among the great man-made objects. They're built to *last*. All Ludlow and Rensselaer hydrants are made to stay on the job through years of rough treatment and rigorous climate —never quitting!

Developed through nearly 100 years of practical experience, Ludlow and Rensselaer hydrants have *earned* their title of "watchdogs of American property." Without exception, they give you the 4 basic requirements for hydrant performance: simplicity of design, absolutely tight closure, no freezing and no flooding due to standpipe breakage.

WRITE TODAY for L&R Fire Hydrant Catalogs showing a model for every need.

LUDLOW & RENSSELAER
VALVES AND HYDRANTS

THE LUDLOW VALVE MANUFACTURING CO., INC., TROY, N.Y.—SINCE 1861

partment provides service lines from main to meter, which is set approximately three feet from the property line. Outside the city limits, the consumer must pay the actual cost of materials and installation plus 10%.

2. Inside city limits the city pays the entire cost of main extensions in new subdivisions, but developer must guarantee an annual return of 10% of the cost of installation over a period of 10 years.

3. The water department operates the sewage treatment plant, but not the rest of sewer services. The water rates cover sewer service expenses.

4. National Cash Register equipment is used for automatic billing.

5. Rates were increased by 75% in January 1956. Water use was affected. Further adjustment is not needed at present.

ROBERT D. WRIGHT
Director
City Water Department
Lynchburg, Virginia.

PHILADELPHIA, PA.

A minimum rate is charged which includes a fixed minimum allowance of water for said rate. There is an additional charge for all water used in excess of the minimum.

The minimum charge and fixed minimum allowance are for a one-year period; both are subject to proration for service rendered in a greater or lesser period. Billing for the minimum charge is made on an annual basis. Bills for use of excess water may be rendered for periods less than one year, depending on the quantity of water consumed.

Rates Per Annum

All water in excess of the minimum allowance is charged for at the rate of 9c per 100 cubic feet. The city does not serve any domestic water outside city limits.

Minimum Annual Charge

Meter Size (in inches)	*Allowance (cubic feet)*	*Charge*
⅝	4,000	$ 13.60
¾	6,000	21.00
1	9,000	31.00
1¼	16,000	54.00
1½	25,000	85.00
2	65,000	220.00
3	145,000	480.00
4	257,500	870.00
6	575,000	1,940.00
8	1,150,000	3,870.00
10	1,600,000	5,420.00
12	2,300,000	7,740.00

Fire Protection

There is no charge for fire service connections inside city limits.

Outside city limits, fire protection is provided only to properties on the opposite sides of streets which form city boundaries when those properties cannot avail themselves of adequate fire protection from other sources. The charges for this fire service are:

Connection Size (in inches)	*Annual Charge*
3	$100.00
4	135.00
6	265.00
8	470.00

Typical Annual Costs

Gallons	*Cubic Feet*	*Charge*
36,000	4,800	$14.32
60,000	8,000	17.20
120,000	16,000	24.40

General Data

Population served 2,200,000
Miles of mains 3,000
Services are 99.75% metered
Supply—Rivers
Treatment—Complete filtration
Plant capacity ..... 470 mgd
Average demand ..... 370 mgd

Remarks

1. The Water Department provides no part of the service line, but it maintains those larger than 3 inches in diameter from the main to the curb.

2. For new main extensions, owner pays $3 per front foot for pipe laid in street, $4 if laid inside curb line. Any cost above that is borne by the Water Department.

3. Water and sewer services both are operated by the Water Department.

4. IBM automatic billing equipment is used for billing.

5. Rates were increased by 28% on January 1, 1958. Water use was not affected and further adjustment is not presently needed.

G. E. ARNOLD
General Superintendent
Philadelphia Water Department
Philadelphia, Pennsylvania

SANDUSKY, OHIO

Rates Per Month or Quarter

Sandusky has two classes of customers: monthly and quarterly. Monthly customers are those using more than 25,000 cubic feet of water per month: quarterly customers are those using less than 25,000 cubic feet.

Cubic Feet Monthly Customers	*Cubic Feet Quarterly Customers*	*Per 100 Cubic Feet Charge*
First 2,000	First 6,000	$0.16
Next 5,000	15,000	.13
Next 10,000	30,000	.11½
Excess	Excess	.10

(Continued on page 165)

ONLY POOL WARRANTED AGAINST RUST, CRACKS, AND LEAKS

CHESTER ALL-ALUMINUM POOLS

• Indoor and Outdoor Pools in Olympic and A.A.U. Standard Sizes Custom-designed for Clubs, Municipalities, Parks, Hotels, Institutions, Schools.

←*T-Shape Chester pool at Washington Park, Kenosha, Wisconsin. 47' x 165' with 35' x 42' diving bay. Ground broken, May 6, 1959 — opened for swimming in less than 12 weeks. Chester DIAVAC Filter provides 325,000 gal. 6-hour turnover.*

Assembled in a few days on the site from factory-fabricated battleship thick plate aluminum sections. Expert M.I.G. arc welding by factory technicians insures permanently water-tight joints.

Usually costs less to install than other types because prefabrication minimizes labor on the site. Exclusive built-in overflow and recirculating ducts also eliminate costly field piping.

Always costs less per year than any other pool because of the proven inherent imperviousness of aluminum to both interior and exterior corrosion . . . virtually no maintenance, no cracks or leaks. Proven by numerous industrial applications where only aluminum has withstood the assaults of strong chemicals. Proven by every battered aluminum pot that has endured vegetable acids for a decade or more in your kitchen. Proven for five years in pool installations from Texas to Canada.

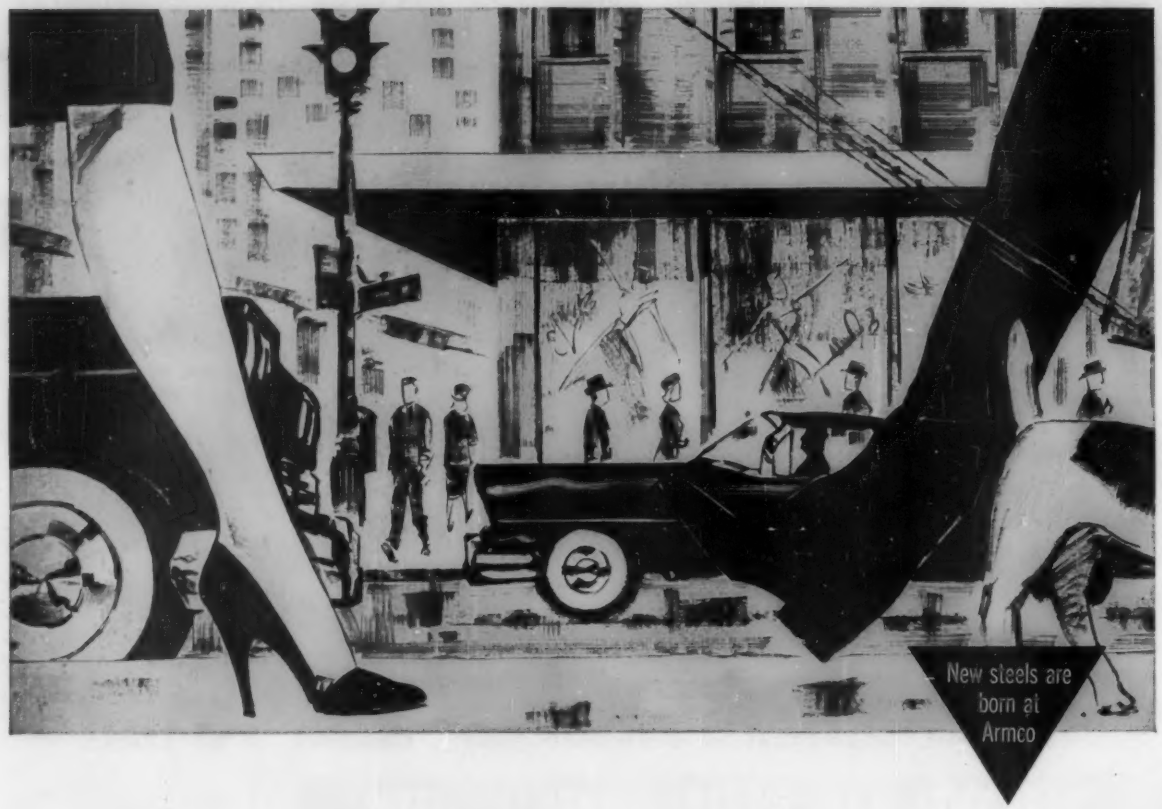
Immune to settling and soil shifts, self-supporting. Engineered by specialists in aluminum and architectural fabrication for 15 years—tanks, weldments, crane booms, pedestrian bridges.

Small wonder that more architects, consulting engineers, and pool planning committees are now specifying the Chester All-Aluminum Pool after careful comparison of all types.

Write for literature and address of pool near you. Also Diavac Filters and Deck Equipment.

CHESTER PRODUCTS, Inc.
Dept. C, Belle Ave. & B. & O. R.R. • Hamilton, Ohio

Traffic as usual, but . . .



20 FEET DOWN

a new sewer is going in

When you tunnel with Armco Liner Plates you keep work underground . . . no traffic interruptions. You save the surface, too. Armco Liner Plates are the strongest made—pound-for-pound. Write for Armco Liner Plate Catalog. Armco Drainage & Metal Products, Inc., 7149 Curtis Street, Middletown, Ohio.

Armco Liner Plate sections are light enough for easy handling.

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation

Minimum Quarterly Charges

Meter Size (in inches)	*Charge*
⅝ and ¾	$4.16
1	6.50
1½	10.50
2	19.50
3	26.00
4	32.50
6	65.00

Monthly customers have minimum charges ½ of the amounts above.

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200 (Min.)	$4.16
15,000	2,000 "	4.16
30,000	4,000	6.40

General Data

Population served	32,000
Miles of mains	96
Services (100% metered):	
Domestic	8,640
Commercial	60
Supply—Lake Erie	
Treatment—None	
System capacity	27 mgd
Average demand	7.47 mgd

Remarks

1. Utility provides none of the cost of service lines.
2. Utility assumes the cost of intersections for new main extensions. Consumer pays the rest.
3. Sewer services are not operated by the Water Distribution Department of Sandusky, but it bills for them along with the water bill.
4. Burroughs automatic equipment is used in billing.
5. Water rates were last revised October 16, 1954.
6. There is no charge to city residents for fire protection.

A. W. GRATHWOL
Superintendent
Water Distribution Department
Sandusky, Ohio.

SUPERIOR, WIS.

Rates Per Month

Cubic Feet	*Per 100 Cubic Feet*
First 500	$0.25
Next 1,500	.19
" 48,000	.10
" 50,000	.09
Excess	.08

The above rates are in addition to the service charge below.

Service Charge

Meter Size (in inches)	*Charge*
⅝	$ 0.85
¾	1.30
1	2.25
1½	4.50
2	8.00
3	17.00
4	30.00
6	70.00

There is no minimum other than the service charge.

Fire Protection

Private:

General Service	*Fire-Protection Service Connection*				
Meter Size	2"	3"	4"	6"	8"
None	$5.00	$8.00	$12.00	$20.00	$40.00
⅝	5.25	8.25	12.00	20.00	40.00
¾	5.50	8.50	13.00	21.00	41.00
1	6.25	9.25	14.00	22.00	42.00
1½	8.50	11.50	15.00	24.00	44.00
2	...	13.00	17.00	25.00	45.00
3	...	...	24.00	32.00	52.00
4	...	...	...	48.00	68.00
6	...	...	...	...	100.00

Municipal:

The Superior Water, Light and Power Company charges the City of Superior approximately $7,234 a year for municipal fire protection.

Typical Monthly Costs

Gallons	*Cubic Feet*	*Charge*
3,000	400	$1.85
5,000	667	2.42
10,000	1,333	3.68

General Data

Population served		36,500
Miles of mains		103.65
Services	*Number*	*% Metered*
Domestic	8,269	100
Commercial	720	100
Other	127	85.8
Supply—Shallow wells		
Treatment—Chlorination and filtration		
Plant capacity		7 mgd
Average demand		3.5 mgd

Remarks

1. Utility provides service line to property only.
2. Utility provides the cost of new main extensions.
3. The Superior Water, Light and Power Company has nothing to do with sewer services.
4. Automatic billing equipment is not used.
5. Water rates were last increased in May 1953, by 24.7% (fire protection: 11%). Water use was not affected. Further adjustment is needed.

E. L. SMITH
Secretary and Treasurer
Superior Water, Light and Power Co.
Superior, Wisconsin

The 1959 National Electric Code is available at $1 from the National Fire Protection Assn., 60 Batterymarch St., Boston 10, Mass.

NOW AVAILABLE

Rugged Wisconsin Replacement Engine for Gravely Tractors!

Model BKN 7 hp replacement kit is specially adapted to make a good tractor even better!

Put the Wisconsin BKN on your Gravely tractor — convert man-hours into cost-cutting workhours. Simply complete and mail the handy coupon below for more detailed information.

The "ready-to-install" Wisconsin BKN replacement engine packs a lot of work- and time-saving benefits. It's tailored for fast, easy installation — and it's built to give years of trouble-free, year-around service.

The BKN is a rugged field-proved workhorse engine. It starts fast and works steadily in crackling sub-zero weather or in scorching 140° F heat. The BKN has extra load-lugging power to bull the tractor through snowdrifts — to plow through thawing or hard, dry ground — and to breeze through thick, heavy growth.

All materials and components are of the highest quality for long engine life and efficient operation. Features include: tapered roller main bearings on both ends of the drop-forged steel crankshaft; fast-starting high-tension outside magneto with impulse coupling; positive pump-circulated lubrication; and a large-capacity cooling fan.

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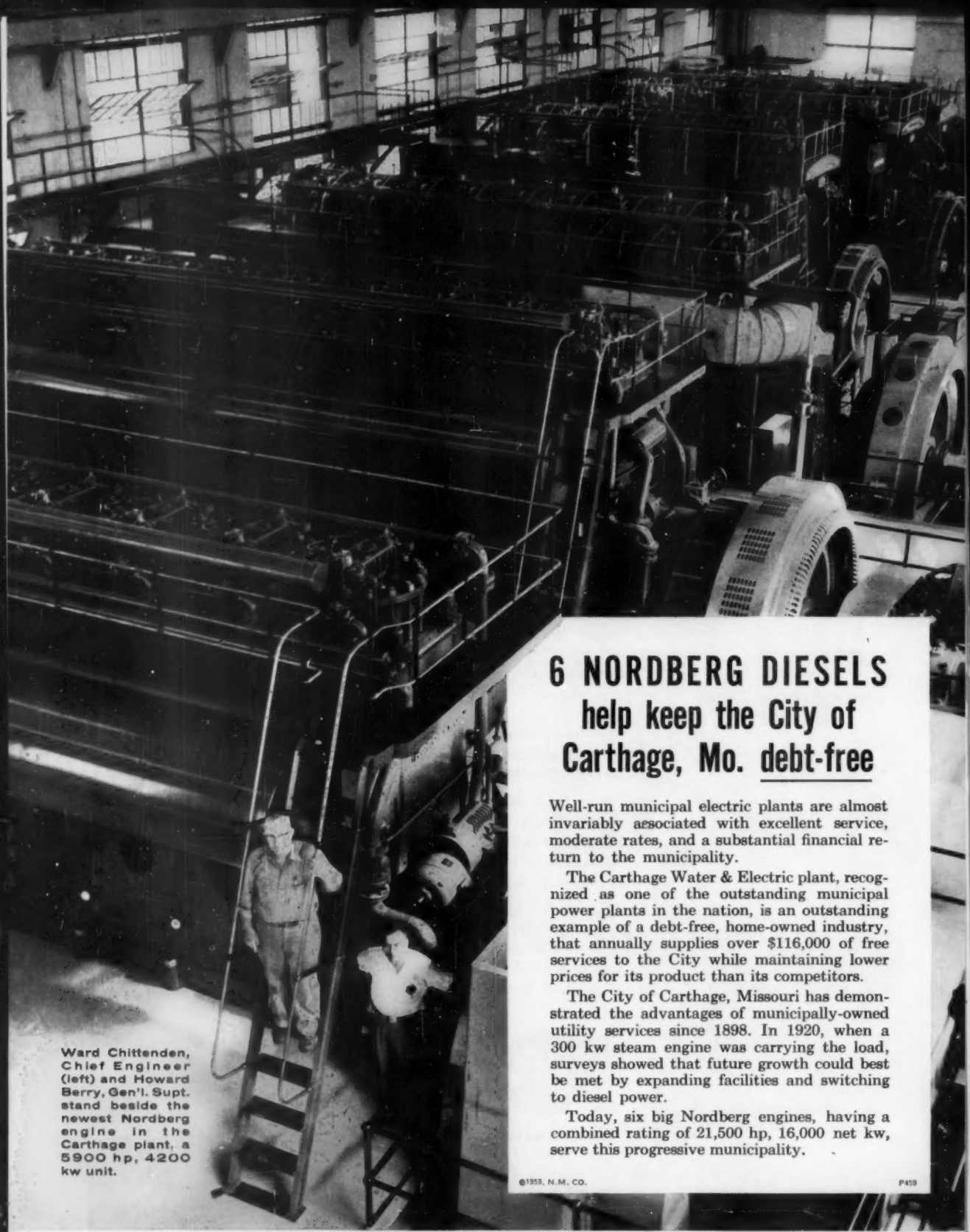

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Municipal Training Course Emphasizes "How"

At the University of North Carolina's Institute of Government a course in municipal administration has been offered to mayors, managers, and department heads of North Carolina towns and cities for the past five years. The course, consisting of 165 hours of lectures, discussions, and problem-solving, has met with enthusiastic response from municipal officials throughout the state.

A similar course is offered by the Institute to students of city government. This course emphasizes *how* municipal services are planned and carried out rather than *what* services a city provides its residents. Thirty hours are devoted to classroom discussion of finance administration, personnel administration, and city planning, with students and the three instructors participating freely. Students taking the course agree that open discussion of such subjects as the budget process, tax structure, purchasing, position classification and pay plans, training of municipal employees, control of private development, and a multiplicity of other city problems is helpful in clarifying issues often left nebulous in classes where the lecture method is used. Assigned readings in the International City Managers' Association book, *The Techniques of Municipal Administration*, in various planning and personnel ordinances in force in North Carolina cities, in finance bulletins issued by the Institute of Government, and in reprints of periodical articles relating to the issues presented are used to supplement classroom discussions.

Field Study

Undoubtedly the most beneficial part of the course is the problem phase, which centers around an intensive study of a North Carolina city. In the 1959 spring semester class members made two all-day field trips to Wilson, an eastern North Carolina city of 30,000 residents in the heart of the tobacco belt. The purpose of the first trip was to gain an understanding of the operation of a city government and featured 15- to 20-minute talks by the city manager and each department head plus a quick tour of the city's fire station, water and power plants, and new sewage treatment plant.

The purpose of the second trip was to collect data on the major operations of a particular department of a city government. The class was divided into teams; each team was assigned one of the following departments: police, fire, public works, recreation, and public utilities. Then the class members of the teams were required to analyze their findings and report to the full class.

This course was first offered in 1955 and, according to George Esser, Institute staff member and one of the three instructors, it will be offered each year for an indefinite period. Although Mr. Esser foresees no major change in course content, he and his two fellow instructors, Donald Hayman and Philip Green, intend to furnish students of future classes with more background information on the government and economic and social conditions in the city chosen for study than has been previously provided.

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ZONING AND PLANNING NOTES

Edited by NORMAN WILLIAMS, Jr.

Housing Code

MASSACHUSETTS. *Parquette* v. *City of Fall River*, 155 North Eastern (2d) 775 (Supreme Judicial Court (highest court), January 15, 1959).

This case involved the application of a new general city housing code to "cold water flats in Fall River. It appeared that such cold water flats constituted some 25% of all the housing accommodations available in the City of Fall River, a city with a population over 100,000; and the housing code in question required installation in all dwelling units of facilities for hot water, of bath-tub or shower, and for room heating, and limited occupancy. The ordinance was challenged on the ground that such improvements would be expensive and burdensome in such cold water flats.

In the opinion, the Court held that this decision must be confined to provisions which might apply directly to the plaintiffs. The Court held that while such minimum requirements might constitute "an invasion of vested property rights", such an invasion "is not necessarily unlawful." In short, the ordinance was upheld.

Amortization and Termination of Non-Conforming Uses—Auto Wrecking Yard In Residence District

KANSAS. *Spurgeon* v. *Board of Commissioners of Shawnee County*, 317 Pacific (2d) 798 (Supreme (highest) Court, November 9, 1957).

In this case, the county zoning ordinance in effect in the unincorporated area around the City of Topeka required automobile wrecking yards located in residence districts to be removed within 2 years. These regulations were challenged in an area, zoned for residence but with a characteristic mixture of land use, which was located between a residential and an industrial area.

In the opinion the Court noted that there were three alternative county zoning enabling laws in Kansas, and held that the County could take its choice on which one to use. The Court then noted with approval the increasing tendency to uphold zoning regulations requiring the termination of non-conforming uses.

Recent Development Cases

MINNESOTA. *Housing and Redevelopment Authority of City of St. Paul* v. *Greenman*, 96 North Western (2d) 673 (Supreme (highest) Court, May 29, 1959).

CONNECTICUT. *Bahr* v. *O'Brion*, 149 Atlantic (2d) 691 (Supreme Court of Errors (highest court), March 4, 1959).

In the Minnesota case, the City of St. Paul was proceedng under the Minnesota urban redevelopment legislation to condemn a 66-acre blighted area, adjacent to the State capitol, for resale for residential and commercial redevelopment by private capital. These proceedings were challenged on the usual ground that, because of the resale to private parties, the condemnation was not for a "public use."

The opinion followed the familiar and long-established lines of argument in this field of law. After reviewing some of the authorities, the Court held that it was now settled law that redevelopment of blighted areas and their resale to private parties represented a public use.

> "Although there are holdings to the contrary, the overwhelming weight of authority which we follow is to the effect that, when slum areas have been reclaimed and redevelopment achieved, the public purpose has been fully accomplished. The fact that the act does not thereafter insure a con-

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tinued use for public purpose does not in any way affect the purpose of the act or render the taking of the property a taking for a use or purpose which is not public."

The Court noted that the proximity of the redevelopment area to the state capitol was an important factor in this situation, and approved the inclusion of such an aesthetic factor in the redevelopment.

In the Connecticut case, as part of the large-scale redevelopment of New Haven, the city proposed to demolish most of the buildings in a substantial area bordering on the main shopping street (Church Street), near New Haven Green, and to sell the land for private commercial redevelopment. This Church Street project included both the redevelopment of this key part of the central business district, and the redevelopment of the frontage along a wide new street running from the central business district to the railroad station—and was also adjacent to the Oak Street redevelopment, which would bring a super highway connection practically into downtown New Haven. These proceedings were challenged by a jewelry store which owned and occupied one half, and rented out the other half, of a modern two-story building on one of the redevelopment blocks.

After reviewing the studies which preceded these two major redevelopment projects, the Court noted that the block in question was roughly two thirds substandard and one third standard. The principal question in the case involved whether the evidence offered by the property owner, to prove that the taking was for a private and not a public purpose, was properly excluded in the Court below. The Court held that such evidence should have been admitted and considered, and that the lack of any allegation of fraud was not sufficient basis for its exclusion. As a result of this decision, the city bought the building for a much higher price, and went ahead with the redevelopment project.

IFHP Meets in Italy

The International Federation for Housing and Planning assembled 164 delegates with 68 aides from 20 countries in Perugia, Italy, this September for a meeting of its Council. Delegates made housing for special groups — the aged, slum dwellers, and low income families—their main topic of discussion.

Standing committees on traffic, housing societies, rent and family income, and the planning profession held sessions, and offers were accepted from French, German, Polish and other national groups to provide secretariats for these committees to facilitate their operation throughout the year.

Delegates reported on plans for the Federation's Congress to be held in San Juan, P.R. in 1960 and for the 1962 Congress in Paris.

Delegates from the U. S. included Charles S. Ascher, representative of IFHP at the UN.

LEGAL NOTES AND DECISIONS

Prepared by NATIONAL INSTITUTE OF MUNICIPAL LAW OFFICERS, Charles S. Rhyne, General Counsel

Building Permit Fees Invalid

In action involving validity of building permit fees, held fees may not include a pro-rata share of entire cost of government, including police protection, fire protection, street maintenance and sewer construction. *University Custom Homes, Inc.* v. *Township of Redford*, 96 N.W.2d 151 (Mich., April 13, 1959)

Condemnation—Channel Easement Through Oyster Beds

In proceeding by town to condemn easement to dredge deep water channel through oyster ground held under lease from state, held lessee of oyster grounds granted damages. *Town of Cape Charles* v. *Ballard Brothers Fish Co.*, 107 S.E.2d 436 (Va., March 16, 1959)

Contractor—Insurer Not Entitled to Mechanic's Lien

In suit by insurer of public contractor against surety on contractor's bond, held plaintiff not entitled to benefits of Trust Fund Act on money held by surety on ground that surety was entitled to receive funds due contractor. *Key Agency* v. *Continental Casualty Co.*, 149 A.2d 797 (N.J. Super., Ch. Div., March 20, 1959)

Intoxicating Liquor—License Revoked

In action concerning revocation of license due to "strip acts" and other activities in bar, held statute making it unlawful to permit any immoral entertainment on licensed premises and providing penalty of revocation of license had reasonable relation to evils sought to be controlled and was proper exercise of police power. *In Re Tahiti Bar, Inc.*, 150 A.2d 112 (Pa., March 25, 1959)

Parks—Easement Over Denied

Where subdividers dedicated and conveyed lot to village for park purposes, held president of village not authorized to grant perpetual right of way over lot to other persons in lieu of damages owed them. *Birmingham Park Improvement Assoc.* v. *Rosso*, 95 N.W.2d 885 (Mich., April 14, 1959)

Police—Conviction For Resisting Arrest Upheld

In appeal of conviction for resisting police officer in execution of search warrant, held passive resistance such as standing in way of officer and telling him he cannot search premises is violation of statute. *Patterson* v. *City of Sylacauga*, 111 So.2d 25 (Ala., April 7, 1959)

Sewer Rates Invalid

In suit by taxpayer to invalidate proposed sewer rates, held annual charge of $40 in one district and $66 in another established by sewage authority, which difference in rates was based primarily on cost of extending sewer to unserviced area, was not uniform and was invalid. *Kline* v. *Bellmawr Sewage Authority*, 150 A.2d 88 (N.J. Super. Ct., Ch. Div., March 25, 1959)

Streets—Extension Valid

In action to restrain spending of motor fuel tax funds in connection with extension of city street, held since ordinance might be invalid continuance granted to give city opportunity to pass valid ordinance. *Hallstrom* v. *City of Rockford*, 157 N.E.2d 23 (Ill., March 20, 1959)

Taxation—City's Recovery from County Denied

In action to recover taxes paid under protest to county, held that mere fact that old plant remained in existence did not mean that new city-owned electric plant was improvement rather than replacement subject to taxation where old plant was of little value. *City of Los Angeles* v. *County of Mono*, 337 P.2d 465 (Calif., April 8, 1959)

Workmen's Compensation—Policeman Injured on Bus—City Must Pay

Where city acquiesced in patrolmen riding home in buses free of charge which mutually benefited patrolmen and city, held patrolman injured in fall stepping off bus on way home was "in course of employment" and entitled to workmen's compensation *Jasaitis* v. *City of Paterson*, 150 A.2d 55 (N. J. Super. Ct., App. Div., April 6, 1959)

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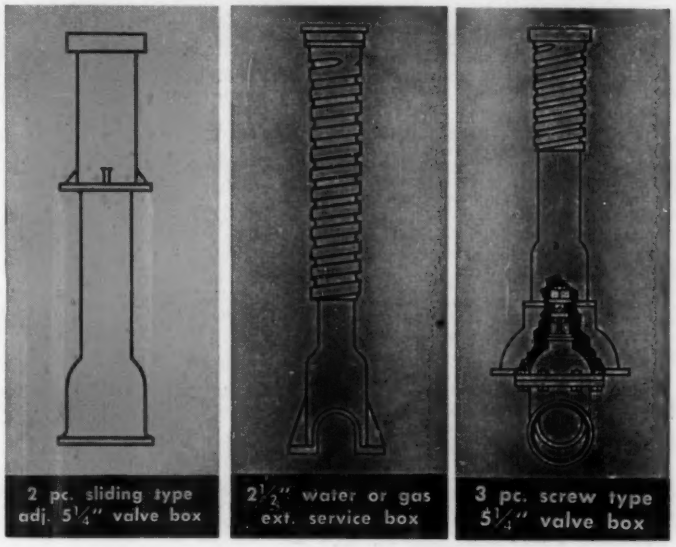

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RECENT CITY MANAGER APPOINTMENTS

Dirick E. Nedry, Payette, Idaho | *John F. Lee, Victoria, Tex.* | *Max Holland, Kinston, N. C.* | *Jack F. Neel, Roxboro, N. C.* | *Ned W. Phye, Jr., Fremont, Neb.* | *Tom Henry, Brevard, N. C.*

A. KYLE ROOP, JR., manager of Pearisburg, Va. for the past two years, was recently appointed manager of Clifton Forge, Va., succeeding William S. Coburn, now manager of Porterville, Calif. Mr. Roop, formerly employed by the Virginia State Highway Department, has also served as manager at Lexington, Va.

ARCHER SCRIBNER has been appointed as the new manager of Thomaston, Me., succeeding Harold W. Putnam, retired. Mr. Scribner previously served as manager of Patten, Van Buren, Calais, and Old Town, Me.

OTIS SCROGGINS, county surveyor of Haskell County, Okla. has been appointed city manager of Stigler, Okla. He succeeds John Wells, who resigned. Mr. Scroggins was connected with the Oklahoma Highway Department for 12 years.

MARION SEBASTION is the new manager of Santa Fe, N. M., succeeding Howard F. Ashbaugh, deceased. Mr. Sebastion formerly served as clerk for the City of Santa Fe.

NORRIS W. STILPHEN, manager of Ipswich, Mass. for the past four years, was recently appointed manager of Deerfield, Ill., succeeding Royce W. Owens. Mr. Stilphen formerly served as manager of Old Orchard Beach, Me.

RICHARD D. THOMAS, administrative assistant of Scottsbluff, Neb. has been appointed the new manager of Slater, Mo., succeeding Arthur J. Mulvihill. Mr. Thomas has previously served as the assistant business manager of Ottawa University.

ROBERT WELLS, clerk-auditor of Upper Arlington, Ohio for the past four years, has been appointed manager of that city, succeeding C. C. Ryan.

LAURENT WILSON, secretary-treasurer of Pierrefonds, Quebec, Canada has been appointed the first manager of that city. Mr. Wilson was previously associated with the Canadian federal government for five years.

WILLIAM WOOLLETT, JR., assistant to county-city coordinator, Los Angeles County, Calif., was recently appointed the first manager of Rosemead, Calif. Mr. Woollett was previously administrative assistant of Los Angeles County, Calif.

ORIN F. NOLTING
Executive Director
International City Managers' Association

ROBERT M. JEFFREY, assistant superintendent of Ottawa Hills, Ohio, has been recently appointed the first manager of that city.

JOHN F. LEE, assistant to City Manager Casey Fannin of Columbia, Mo., has been appointed manager of Victoria, Tex., succeeding Ivan P. Oliver, now manager at Gladewater, Tex.

C. B. LEWIS, manager of Joliet, Ill. for the past four years and for two years before that manager of Mt. Vernon, Ill., was recently reappointed manager of Mt. Vernon. Mr. Lewis has also served as manager of Mangum, Okla.

WALTER E. LOONEY, manager of Gaylord, Mich. for the past three years, has been appointed the first manager of Munising, Mich. Mr. Looney previously served as the manager of Caspian, Mich., for six years.

JAMES MARTIN, manager of Eagle Lake, Me. for the past three years, has been appointed manager of Guilford, Me., succeeding Arnold R. Hopkins.

REED MCKINLEY, acting city manager, is the new manager of Kansas City, Mo., succeeding L. P. Cookingham, now manager of Fort Worth, Tex. Mr. McKinley was previously public works director in Kansas City.

DIRICK E. NEDRY, city clerk and police judge at Coeur d'Alene, Idaho, has been appointed city administrator of Payette, Idaho.

JACK F. NEEL, manager at Tazewell, Va., for the past two years, is the new manager of Roxboro, N. C., succeeding W. F. Timberlake who has retired.

LEON NELSON, assistant manager of Ponca City, Okla., was recently appointed as manager of that city, succeeding Frank A. Winsted. Mr. Nelson formerly served as the assistant manager at Enid, Okla.

NED W. PHYE, JR., assistant manager and finance director, Boulder, Colo., is now administrator of Fremont, Neb.

MAX N. RHOADS, director of finance and purchasing agent of Owensboro, Ky. for the past three years, was recently appointed manager of that city, succeeding Ernest M. Ford.

R. MARSHALL BINGHAM, manager of Haltom City, Tex., for the past two years, was recently appointed manager of Harlingen, Tex., succeeding Douglas Henslee, who resigned to enter private business. Mr. Bingham was previously manager at Dalhart, Tex., and Okmulgee, Okla., and administrative assistant in Lamesa, Tex.

JAMES C. BOYD was recently appointed manager of Wheeling, W. Va., succeeding Robert L. Plummer.

WILLIAM S. COBURN, manager of Clifton Forge, Va. for the past three years, is the new manager of Porterville, Calif., succeeding Charles J. Cummings. Mr. Coburn previously served as manager of Anne Arundel Co., Md., and Hampton and Elizabeth City Co., Va.

JOHN O. HALL, associate advisor to the Institute of Public and Business Administration at the University of Karachi under the University of Pennsylvania program, has been appointed the new manager of Savannah, Ga., succeeding F. A. Jacocks, who resigned to return to the U. S. Public Health Service. Mr. Hall was formerly manager of Nowata, El Reno, and Muskogee, Okla., and Pueblo, Colo.

M. DON HARMON, manager of Boulder, Colo. for the past six years, is the new manager of Joplin, Mo., succeeding R. B. Riddle, who resigned.

JOHN H. HEINTZ, manager of Franklin, Ohio for the past year, has been appointed manager of Pequannock Township, N. J., succeeding Walter T. Schmidt.

CYRIL MCC. HENDERSON, formerly the city manager of Kitimat, B. C. for the past six years, was recently appointed as the first manager of North Vancouver, B. C.

TOM HENRY, for the past six years city engineer and director of public works for the City of Cherryville, N. C., was recently appointed the first manager of Brevard, N. C.

MAX HOLLAND, manager of Camden, S. C., for the past six years, was recently appointed the new manager of Kinston, N. C., succeeding Roy R. Robinson, now director of base operations and maintenance at Bartow Air Base, Fla. Mr. Holland was previously assistant manager of Camden, S. C.

DEAN D. HUNTER, assistant manager of Corpus Christi, Tex. has been appointed manager of Mountlake Terrace, Wash., succeeding Evan E. Peterson.

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CONVENTIONS — WHEN AND WHERE

Conventions listed this month for the first time are indicated by an asterisk (*)

***Jan. 6-8—Cincinnati, Ohio**
AMERICAN SOCIETY OF CIVIL ENGINEERS. Conference on "Economics of Pollution Control" (Hotel Netherland-Hilton). Sec., William H. Wisely, 33 W. 39th St., New York, N. Y.

Jan. 6-8—New York, N. Y.
NORTHEASTERN WEED CONTROL CONFERENCE. Annual Meeting (Hotel New Yorker). Sec.-Treas., D. A. Schallock, Rutgers, The State University, New Brunswick, N. J.

Jan. 11-15—Washington, D. C.
HIGHWAY RESEARCH BOARD. Annual Meeting (Sheraton-Park Hotel). Dir., Fred Burggraf, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Jan. 18-21—Cincinnati, Ohio
AMERICAN ROAD BUILDERS' ASSOCIATION. Annual Convention (Netherland Hiltcn Hotel). Exec. Vice Pres., Louis W. Prentiss, 600 World Center Bldg., Washington 6, D. C.

Jan. 21-22—New York, N. Y.
NEW YORK SEWAGE AND INDUSTRIAL WASTES ASSOCIATION. Annual Meeting (Park Sheraton Hotel). Exec. Sec., R. C. Sweeney, State Department of Health, 55 Church St., White Plains, N. Y.

Jan. 25-27—Memphis, Tenn.
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS. Annual Meeting (Peabody Hotel). Sec.-Treas., Ward K. Parr, 1224 E. Eng. Bldg., Box 619, Ann Arbor, Mich.

Jan. 28-30—Hollywood, Calif.
CALIFORNIA STREET & HIGHWAY CONFERENCE. Annual Meeting (Hollywood-Roosevelt Hotel). Sec., Bob Glenn, I.T.T.E., University of California, Berkeley, Calif.

Feb. 3-5—Indianapolis, Ind.
AMERICAN WATER WORKS ASSOCIATION—Indiana Section. Annual Meeting (Sheraton-Lincoln Hotel). Sec.-Treas., Chester H. Canham, 1330 W. Michigan St., Indianapolis 7, Ind.

Feb. 8-10—New York, N. Y.
ASSOCIATION OF TOWNS OF THE STATE OF N. Y. Annual Meeting (Commodore Hotel). Exec. Sec., William K. Sanford, 91 State Street, Albany, N. Y.

***Feb. 23-26—Santa Monica, Calif.**
CALIFORNIA MUNICIPAL UTILITIES ASSOC. Annual Meeting (Miramar Hotel). Sec., F. V. Frey, 100 N. Garfield Ave., Room 108, Pasadena, Calif.

***Feb. 28-March 4—College Station, Tex.**
TEXAS WATER & SEWAGE WORKS ASSOC. Annual Short School (Memorial Student Center, Texas A & M College). Sec., G R. Herzik, Jr., 2202 Indian Trail, Austin, Tex.

March 6-12—San Francisco, Calif.
AMERICAN CONCRETE PIPE ASSOCIATION. Annual Convention (The Fairmont Hotel). Managing Dir., Howard F. Peckworth, 228 N. LaSalle St., Chicago 1, Ill.

***March 16-18—Chicago, Ill.**
AMERICAN WATER WORKS ASSOC.—Illinois Section. Annual Meeting (Pick-Congress Hotel). Sec., Dewey W. Johnson, Cast Iron Pipe Research Assoc., 3440 Prudential Plaza, Chicago 1, Ill.

***March 16-18—Little Rock, Ark.**
ARKANSAS WATER & SEWAGE CONFERENCE. Annual Meeting (Marion Hotel). Sec., C. W. Oxford, College of Engineering, Univ. of Ark., Fayetteville, Ark.

***March 20-23—Savannah, Ga.**
AMERICAN WATER WORKS ASSOC.—Southeastern Section. Annual Meeting (De Soto Hotel) Sec.-Treas., N. M. de Jarnette, 309 State Office Bldg., Atlanta 3, Ga.

***March 21-24—San Francisco, Calif.**
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA. Annual Convention (Masonic Temple). Exec. Dir., James D. Marshall, 20th & E Sts., N.W., Wash 6, D. C.

***March 29-April 1—Philadelphia, Pa.**
ASSOCIATION OF HIGHWAY OFFICIALS OF THE NORTH ATLANTIC STATES. Annual Meeting (Bellevue-Stratford Hotel). Exec. Sec., Kenneth D. Rice, 1035 Parkway Ave., Trenton, N. J.

***March 30-April 1—Atlantic City, N. J.**
NEW JERSEY SEWAGE & INDUSTRIAL WASTES ASSOC. Annual Meeting (The Traymore Hotel). Sec.-Treas., Michael S. Kachorsky, P. O. Box 68, Manville, N. J.

April 12-15—Los Angeles, Calif.
AMERICAN SOCIETY FOR PUBLIC ADMINISTRATION. Annual Meeting (University of Southern California). Exec. Dir., Robert J. M. Matteson, 6042 Kimbark Ave., Chicago 37, Ill.

***May 3-5—Washington, D. C.**
AMERICAN PUBLIC POWER ASSOC. Annual Meeting (Hotel Shoreham). Gen. Mgr., Alex Radin, American Public Power Assoc., Suite 830, 919 18th St. N.W., Wash. 6, D. C.

***May 10-12—Washington, D. C.**
NATIONAL HIGHWAY USERS' CONFERENCE Biennial Convention (Mayflower Hotel). Dir., Arthur C. Butler, 966 National Press Bldg., Wash., D. C.

***May 11-14—Chicago, Ill.**
UNITED STATES CONFERENCE OF MAYORS. Annual Meeting (The Conrad Hilton). Exec. Dir., Mr. Harry R. Betters, 1707 H Street N.W., Wash. 6, D. C.

May 15-20—Bal Harbour, Fla.
AMERICAN WATER WORKS ASSOCIATION. Annual Convention (Americana Hotel). Exec. Sec., Raymond J. Faust, 2 Park Ave., New York, N. Y.

***May 16-20—Montreal, Canada**
NATIONAL FIRE PROTECTION ASSOC. Annual Meeting (Queen Elizabeth Hotel). Gen. Mgr., Percy Bugbee, 60 Batterymarch St., Boston, Mass.

***May 22-26—Cincinnati, Ohio**
AIR POLLUTION CONTROL ASSOCIATION. Annual Meeting (Netherland-Hilton). Exec. Sec., Arnold Arch, 4400 Fifth Ave., Pittsburgh 13, Pa.

***May 22-26—Bal Harbour, Fla.**
AMERICAN SOCIETY OF PLANNING OFFICIALS. Annual Conference (Americana Hotel) Exec. Dir., Dennis O'Harrow, 1313 E. 60th St., Chicago 37, Ill.

***May 24-27—Washington, D. C.**
NATIONAL RIVERS & HARBORS CONGRESS. 47th National Convention (Mayflower Hotel). Exec. Vice-Pres., William H. Webb, Suite 523-A, La Salle Bldg., 1028 Connecticut Ave. N.W., Washington 6, D. C.

***May 28-June 3—San Juan, Puerto Rico**
INTERNATIONAL FEDERATION FOR HOUSING & PLANNING and INTER-AMERICAN PLANNING SOCIETY. Joint World Congress (University of Puerto Rico). Sec.-Gen., Humberto Espinosa, P. O. Box 1729, San Juan, Puerto Rico.

***Aug. 14-17—New York, N. Y.**
AMERICAN PUBLIC WORKS ASSOC. Annual Convention (Manhattan Hotel and New York Coliseum). Exec. Dir., Robert D. Bugher, 1313 E. 60 St., Chicago 37, Ill.

Oct. 2-6—Philadelphia, Pa.
FEDERATION OF SEWAGE AND INDUSTRIAL WASTES ASSOCIATIONS. Annual Meeting (The Trade & Convention Center). Exec. Sec., Ralph E. Fuhrman, 4435 Wisconsin Ave. N.W., Washington 16, D. C.

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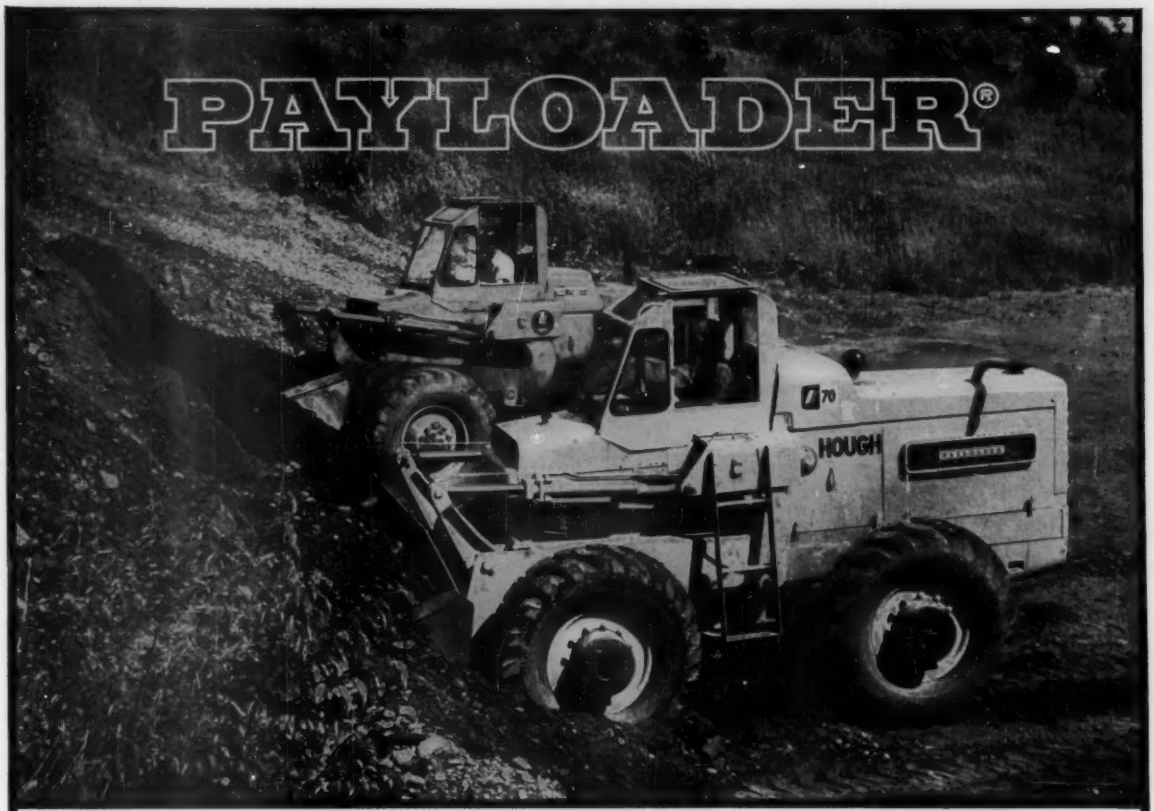

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MUNICIPAL AND CIVIC PUBLICATIONS

Publications on these pages are available from the addresses indicated and are usually free unless a price is given.

Street Sanitation Manual

STREET CLEANING PRACTICE, SECOND EDITION—*Prepared by the Street Sanitation Committee, American Public Works Association. Public Administration Service, 1313 East 60th St., Chicago 37, Ill.* 1959. 424 *pp.* $7.

A completely revised book covering such subjects as local conditions affecting street cleaning, planning cleaning operations and prevention of street dirt through anti-littering campaigns and other means. It also covers special problems, including leaves trees, unimproved streets, weeds, sidewalks and vacant lots, soot and fly ash, catch basin inlet cleaning, snow and ice control and removal and management problems relating to personnel, equipment, budgets, records and costs. An appendix of tables summarizes data on street cleaning practices of 100 cities in the United States and Canada. Another appendix gives provisions of typical ordinances relating to parking, littering, sidewalk clearing, snow clearing and other problems.

TVA's Taxes

TVA POWER AND TAXES—*Tennessee Valley Authority, Office of Power, Knoxville, Tenn.* 1959. 12 *pp.*

A little book that rebuts in probably too quiet a voice the often repeated argument that TVA is somewhat dishonest in its tax policies. The booklet shows that TVA pays about the same state and local taxes as a privately owned utility. Being a federal agency, it pays no federal income tax. But even if it were not, it would pay little in federal income tax since it purposefully manages its affairs to keep its income low—close to the break-even point.

The booklet does *not* provide justification for the federal government to get into the electric power business. Nor does it give any reason why the states in the Tennessee Valley do not accept their responsibilities and operate this as a regional facility rather than asking the entire nation to do it for them. Nor does it explain why the federal government should build a facility that gives economic advantage to one area of the country to the exclusion of its neighbors.

Help for the P.E. Examination Applicant

ENGINEERING ECONOMICS FOR PROFFESSIONAL ENGINEERS' EXAMINATIONS — *By Max Kurtz. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, New York.* 1959. 260 *pp.* $6.50.

A single volume containing all the facts, formulas and tables necessary to save time and insure accuracy in answering virtually any question likely to arise on engineering economics. It is devoted exclusively to helping one prepare for and pass the engineering economics section of the P.E. examinations. Material covered includes the media of investment, the time value of money, sinking funds and annuities, amortization of loans, valuation of bonds, and numerous other aspects of engineering economics. Working aids include many exercises and problems showing typical questions asked in actual P.E. examinations throughout the country, extensive use of graphs to illustrate problems, and many helpful tables.

Building and Other Codes

BUILDING AND RELATED CODES—*Association of Washington Cities, 250 Smith Hall, Seattle 5, Washington.* 1959. 18 *pp.*

This bulletin sets forth a number of recognized building and related codes that may be adopted in the State of Washington by reference pursuant to RCW 35.21.180. Certain data concerning the adoption of future amendments to codes and statutes, how to secure compliance with rules and regulations, and explanatory data in regard to certain agencies preparing building codes, have been included.

City Planning

TOWN BUILDING IN HISTORY—*By Frederick R. Hiorns. Criterion Books, Inc., 257 Fourth Avenue, New York 10, N. Y.* 1958. 443 *pp.* $15.

A fascinating record of urban culture throughout recorded history. Where else do we find a study that describes Erbil, a Mesopotamian town with 50 centuries of continuous civilized life and still in active service? Who takes the trouble to recall Theodoric the Goth (455-526) "the restorer of cities?" Who today observes that the greatest of all city builders were the Egyptians and their plans are yet worth noting? This is, indeed, a book that combines enjoyable reading with constructive study.

Design of Highway and Airfield Pavements

PRINCIPLES OF PAVEMENT DESIGN—*By E. J. Yoder. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.* 1959. 569 *pp.* $13.25.

This book contains information on the principles as well as practices of the design of airfield and highway pavements. It provides the data an engineer requires in establishing design criteria to fit many conditions to be encountered, showing derivation of present design methods, illustrations of different types of pavement failures, and demonstrations of various methods of evaluation. More than half of the book is devoted to a compilation of basic data. Problems are used to illustrate each method of design as well as fundamentals.

Finances

COMPENDIUM OF CITY GOVERNMENT FINANCES IN 1958—*U. S. Department of Commerce, Bureau of the Census, U. S. Government Printing Office, Washington 25, D. C.* 1959. 128 *pp.* 65 *cents.*

A tabular study of finances in 481 cities of 25,000 or more supplemented by data from selected smaller cities. The information is sufficiently detailed to make conclusions somewhat difficult, except that both expenses and taxes are rising, and that the general property tax still carries about 60% of the burden.

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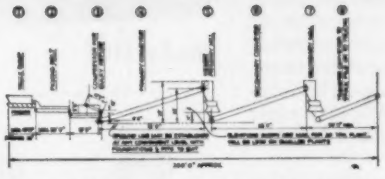

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Metropolitan Government

CONCEPTS IN METROPOLITAN GOVERNMENT—*Legislative Bill Room, State Capitol, Sacramento 14, Calif.* 1959. 28 pp.

A small but intelligently prepared summary of the Toronto and the Dade County, Fla., metropolitan governmental structure, with analysis of their strengths and weaknesses. It also applies this to the situation in California and makes various practical suggestions. One cannot help feeling a little surprise that the San Francisco effort to organize within a metropolitan concept—the City and County of San Francisco—is now 103 years old.

Urban Geography

READINGS IN URBAN GEOGRAPHY—*Edited by Harold M. Mayer and Clyde F. Kohn. The University of Chicago Press, Chicago 37, Illinois.* 1959. 625 pp. $8.50.

This text reverses the usual trend of book writing. Most authors summarize and comment on source material. The compilers of this volume simply reprinted the articles. The result is a wordy, somewhat disjointed collection of copy helpful principally to the city planner, if he has time to wade through it, and if he doesn't already have the articles in his reference file.

ADMINISTRATION & GOVERNMENT

GENERAL—City Problems of 1959—The Annual Proceedings of the United States Conference of Mayors. Edited by Harry R. Betters, Executive Director. The United States Conference of Mayors, 1707 H St., N.W., Washington 6, D. C. 1959. 137 pp. $2.50.

KANSAS CITY, MO.—Charter Administrative Code & Revised Ordinances, Supplement of 1959. Office of the Mayor, City Hall, Kansas City, Mo. 1959 269 pp.

LOS ANGELES COUNTY, CALIF.—Report on the Proposed City of Commerce. County-City Services Division, Chief Administrative Office, 502 Hall of Records, County of Los Angeles, Los Angeles 12, Calif. 1959. 9 pp.

ANNUAL REPORTS

GROTON, CONN.—55th Annual Report. Department of Utilities, 359 Thames Street, Borough of Groton, Conn. 1959. 120 pp.

NEW ORLEANS, LA.—Annual Report of the Mayor. Office of the Mayor, Municipal Building, New Orleans, La. 1959. 64 pp.

ROCHESTER, N. Y.—Report to the People. Office of the President of the City Council, City Hall, Rochester, N. Y. 1959. 20 pp.

STRATFORD, CONN.—Town Report. Office of the Town Manager, Town Hall, Town of Stratford, Conn. 1959. 73 pp.

FINANCE & TAXATION

GENERAL—The Assessment of Leased Equipment. National Association of Assessing Officers, 1313 East 60th St., Chicago 37, Ill. 1959. 59 pp. $3.

MASSACHUSETTS—Proceedings of the Third Annual School for Massachusetts Assessors. Bureau of Government Research, University of Massachusetts, Amherst, Mass. 1959. 61 pp.

MILWAUKEE COUNTY, WIS.—Financial Report. Office of the County Clerk, County Court House, Milwaukee, Wis. 1959. 70 pp.

NASHVILLE, TENN.—Capital Improvements Budget and Program. Nashville City Planning Commission, Executive Office, 303 City Office Building, 2nd Ave., S. and Lindsley Ave., Nashville, Tenn. 1959. 53 pp.

OAK PARK, ILL.—1958 Annual Report of the Director of Finance. Director of Finance, Municipal Building, Village of Oak Park, Ill. 1959. 81 pp.

PHOENIX, ARIZONA—Annual Budget. Finance Director, City Hall, Phoenix, Ariz. 1959. 232 pp.

TEXAS—Proceedings of the First County Auditors' Institute. Institute of Public Affairs, The University of Texas, Austin, Texas. 1959. 52 pp.

MISCELLANEOUS

BILLERICA, MASS.—Yes! We Have Elbow Room in the Town of Billerica. Elbow Room, Town Hall, Billerica, Mass. 1959. 32 pp.

PLANNING, ZONING & HOUSING

CANTON, MASS.—1959 Master Plan Summary Report. By Allen Benjamin, Town Planning Consultant, Wayland, Mass. 1959. 96 pp.

CHICAGO, ILL.—Vacant Land in the City of Chicago, 1958. Department of City Planning, City Hall, Chicago, Ill. 1959. 56 pp.

HIGH POINT, N. C.—Plan for Growth. Department of Planning, City Hall, High Point, N. C. 1959. 45 pp.

NEW YORK—1959 Housing Legislation in New York State. Prepared by Barbara Reach and Phyllis Yaffa. Bureau of Public Affairs, Community Service Society of New York, 105 East 22nd St., New York 10, N. Y. 1959. 167 pp. 50 cents.

PHILADELPHIA, PA.—Non-White Residential Patterns. Commission on Human Relations, 800 Commercial Trust Building, 16 South Broad Street, Philadelphia 2, Pa. 1959. 13 pp.

TRENTON, N. J.—Trenton Central District Area Plan. Greater Trenton Council and Board of City Commissioners, Trenton, N. J. 1959. 32 pp. $3.

PUBLIC SAFETY

SHARPSVILLE, PA.—Traffic Control Signs. Shenango Valley Regional Planning Commission, 61 South Dock Street, Sharon, Pa. 1959. 15 pp.

PUBLIC WORKS

KANSAS CITY, KAN.—1958 Annual Report. Board of Public Utilities, Kansas City, Kansas. 1959. 24 pp.

URBAN RENEWAL

GENERAL—The Crisis in Open Land. The American Institute of Park Executives, Oglebay Park, Wheeling, W. Va. 1959. 26 pp. $1.

GENERAL—Report of the International Seminar on Urban Renewal—The Hague—1958. International Federation for Housing and Planning, 2, Alexanderstraat, The Hague, Netherlands. 1959. 120 pp. $4.

AKRON, OHIO—Urban Renewal. Urban Renewal Commission, City Hall, Akron, Ohio. 1959. 10 pp.

BOSTON, MASS.—Charting the Future of Urban Renewal. Boston Municipal Research Bureau, 25 Pemberton Sq., Boston, Mass. 1959. 44 pp.

NEWARK, N. J.—Newark Urban Renewal Plan. George H. F. Oberlander, Planning Officer, 211 City Hall, Newark 2, N. J. 1959. 128 pp.

WASHINGTON, D. C.—Publications Relating to Urban Renewal 1958. The Public Library of the District of Columbia, 499 Pennsylvania N.W., Washington 1, D. C. 1959. 40 pp.; 8½x11. Send a stamped (9 cents), self-addressed envelope.

WATER

DETROIT, MICH.—Detroit's Water Development Program for the Metropolitan Area. Board of Water Commissioners, Water Board Building, 735 Randolph, Detroit 26, Mich. 1959. 44 pp.

REPRESENTATIVE MUNICIPAL BOND ISSUES

From October 1 to November 2, 1959

Date of Issue	Locality	Amount in $1000	Purpose	Term Yrs. to Maturity	Rate of Int.	Yield %
10/ 1/59	Stratford, Conn.	2,400	Public Improvement	10½	3.90	3.83
10/ 5/59	New Britain, Conn.	1,330	Water, Subway	10½	3.50	3.50
10/ 6/59	Pittsburgh, Pa.	4,100	General Improvement	10½	3.63	3.55
10/ 7/59	Ithaca, N. Y., N.E. Water District	850	Water	16½	3.80	3.77
10/ 8/59	Front Royal, Va.	500	Water	10½	3.70	3.68
10/13/59	Eastlake, Ohio	850	Sewer	11	4.50	4.31
10/13/59	Wilmington, Del.	1,775	Parking, Marine Terminal	13	3.45	3.44
10/14/59	Denver, Colo.	17,000	Gen. Obligation Water	22½	3.75	3.65
10/15/59	Harrison, N. Y.	673	Improvement	11	3.90	3.81
10/19/59	Akron, Ohio	860	Spec. Asses. Str. Imp.	6½	3.75	3.67
10/20/59	Niles, Ohio	880	Sewerage Gen. Oblig'n.	14½	4.25	4.20
10/20/59	Orange, N. J.	645	School and Pub. Imprv.	10½	3.75	3.72
10/21/59	Estherville, Iowa	950	Electric Revenue	11½	4.00	3.90
10/22/59	Lake Worth, Fla.	2,100	Water and Elec. Rev.	17½	4.20	4.20
10/22/59	Plaquemine, La.	1,000	Water, Saw. and Elec. Rev.	21½	4.25	4.31
10/27/59	L. A. Co., Calif., Flood Control District	21,150	Flood Control Impr.	12½	3.75	3.70
10/28/59	Hamilton, Ohio	1,300	Sewer	15	4.00	3.89
10/28/59	St. Louis Co., Mo.	2,100	Public Improvement	10½	3.50	3.50
10/29/59	Camden, N. J.	1,303	Water and Sewer	23⅞	3.50	3.27
11/ 2/59	Corpus Christi, Texas	2,100	Gen. Improvement	14¼	4.00	3.93

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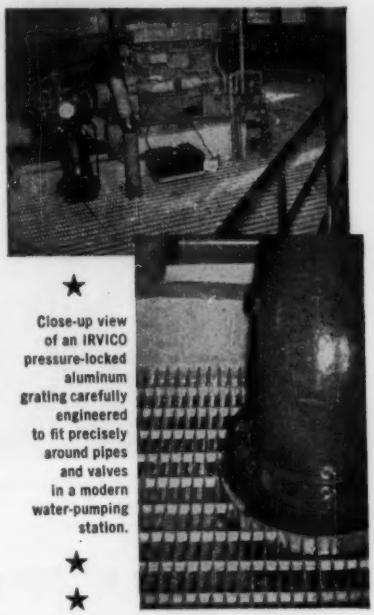

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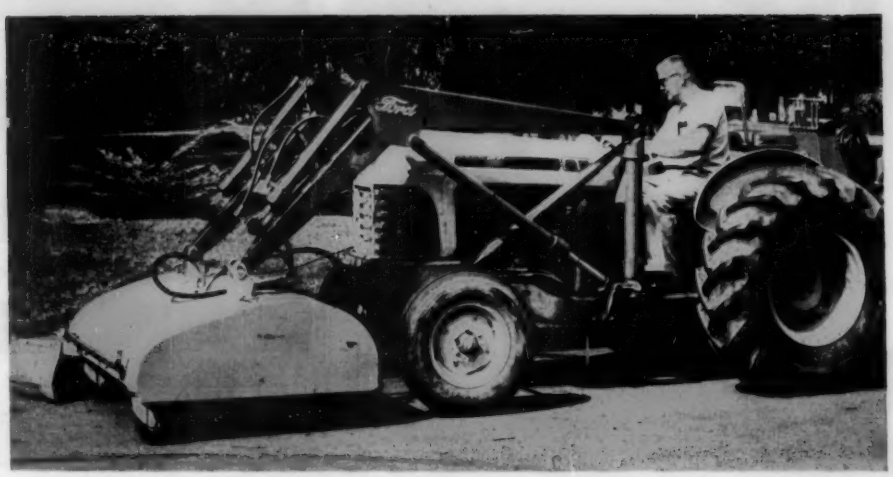

The Mars Pick-Up Sweeper, Model 594, which has been designed to eliminate hand-labor, is interchangeable with the loader bucket of all popular tractor-mounted front-end loaders, and can be detached or attached quickly. Extra valve or plumbing are not needed. Dirt is swept into a pan and loader arms lift the sweeper to dump the load directly into waiting truck or container. The brush is driven hydraulically from loader pump. Optional equipment offered include a gutter brush, a sprinkler system to control dust, broom extension arms for use on certain models where more clearance is needed, or where more reach is desired. For additional information, write MARS EQUIPMENT CO., 5209 BROADWAY, MINNEAPOLIS 22, MINN., or use the Post Card on Page 52. Circle No. 755.

Municipal Boat Marina Facilities

This installation is part of a continuing program at Peoria, Ill. It now comprises 1,000 feet of floating dock, slips for about 150 boats, together with separate service docks for gasoline, refreshments and excursion rides. Peoria expects to increase marina capacity to handle up to 500 boats. This boating facility was designed and installed by Standard Steel Products. It is all-steel construction, floating on steel pontoons. Note the "floating" roller equipped stairway, which moves up and down with varying water levels. For additional information, write STANDARD STEEL PRODUCTS MFG. CO., DEPT. A, 2836 S. 16TH ST., MILWAUKEE 15, WIS., or use the Post Card on Page 52. Circle No. 750.

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tough, durable, no seams, will not CRACK, TEAR or BREAK!

This new SAFE-T-CONE never needs repainting. Just wash it with soap or solvents. Made of polyvinyl-chloride to produce the toughest, *most durable cone on the market*. Outlasts ordinary cone many times . . . . without upkeep!

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New Poly-Cones and All-Rubber cones available in brilliant orange-red fluorescent for extra brilliance, day or night.

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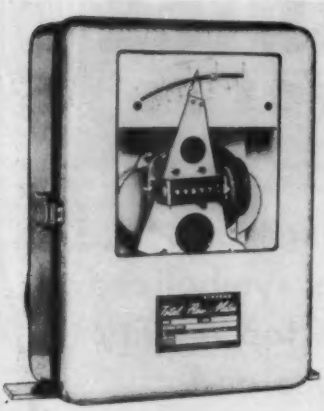
Measures Liquids Flowing in Open Channels



The Stevens Model 60-M Total Flow Meter is lightweight, portable and simple to install. It has been designed especially for low initial cost and dependable service.

Leupold & Stevens Instruments, Inc., Portland 13, Ore., has introduced a new hydrologic instrument—the Stevens Model 60 M Total Flow Meter—designed to measure flow of sewage, industrial wastes, irrigation water and other liquid flowing in open channels.

Total volume of flow through standard weirs or Parshall flumes is read from a counter-totalizer, while instantaneous rate of flow and head are indicated by a pointer and scale. A red index sliding on the index scale and driven by the pointer indicates peak flow. Total volume that has passed through the Parshall flume or weir is registered in cubic feet by five digits on a counter and two on a calibrated disk. Flow indication is in cubic feet per second. Instructions accompanying the instrument include simple formulas for converting the totalizer and flow scale readings to other volume and flow units such as mgd, gpm and acre-feet.

The Model 60 M is mechanically operated. Cam and index pointer are activated by float action and the integrator disk is driven by a spring clock motor. It will operate without attention for eight days.

The meter is furnished as standard for use with one of the following measuring devices: 6" Parshall flume, 90° V-Notch weir, 1' Cipolletti weir or 1' rectangular weir without end contractions.

For further information, write Leupold & Stevens Instruments, Inc., 4445 NE Glisan, Portland 13, Ore., or use the Post Card on Page 52. Circle No. 738.

500-Man Payroll Prepared in One Day

A new NCR electronic accounting machine combines in a single unit the functions of the conventional office calculator, adding machine and accounting machine. The CompuTronic can multiply king-size numbers in a fraction of a second, where a standard calculator requires five seconds, or 15 times as long, to do the same problem.

Stanley C. Allyn, chairman of the board of The National Cash Register Co., shows Sheila Hershey one of the computing units of NCR's new CompuTronic. The machine, shown here with cabinet panels removed, was developed to meet the need for low-cost electronics in the office.

Using the new machine, a person can prepare complete payroll records for 500 employees in a day. The machine automatically checks the accuracy of its calculations. If it should err at any time, it ceases to function until the operator takes the proper corrective action. It can be operated by anyone who can operate a conventional accounting machine.

Up to 31 electronic memory units supply frequently used figures, such as numbers needed to compute taxes and discounts. This means that the machine's mechanical memory units can be saved for storing data needed for accounting purposes.

At the same time that the machine is doing its regular jobs, it can activate a card punch or paper tape punch without any extra effort by the operator. This means that data required for subsequent analyses, breakdowns or management decisions can be preserved for later automatic processing.

First deliveries are scheduled for early in 1960; for details, write to National Cash Register Co., Dayton 9, Ohio, or use the Post Card on the insert following Page 52. Circle No. 740.

Warning Lights—Long Distance, Emergency

The No. 680 flasher safety light and the No. 211 warning light.

Latest additions to the extensive line of hazard-warning apparatus made by the R. E. Dietz Co., Syracuse, N. Y. are the No. 680 flasher and the No. 211 warning light.

The king-size No. 680 has a lens the diameter of a traffic signal—8 inches—and delivers 60 candle power for 650 hours. It is designed for use as an abutment safety light on toll roads and all limited access highways, comes equipped with a single face parabolic reflector lens, two NEDA #6 dry cells, transistorized circuit, carrying handle and mounting bracket. Flash rate is 65 per minute. Tamper-proof mounting and on-off bolts require special Allen-type wrenches. Finished in beacon yellow, it is available with either amber or red lenses. Its weight is 8 pounds.

The No. 211 emergency warning light offers numerous light patterns and colors. For inside its plastic lens, which is available in amber, red, half amber and half red, blue or clear, are four sealed beam bulbs. These bulbs revolve continuously, driven by a motor and gear train assembly housed in the unit's chrome-plated brass base. By using different combinations of bulbs, either one, two, three or four, respectively, the frequency beam patterns can be set at 30, 60, 90 or 100 light impulses per minute.

The new light protrudes no higher

time... *city managements' greatest single cost factor!*

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TIME RECORDERS
TIME STAMPS
WATCHMAN CLOCKS

You can eliminate time leaks and increase the efficiency of all departments with a Lathem machine. Built for a long life of care-free service, Lathem machines are especially designed and engineered to provide for ALL of your time recording needs.

Just check this long list:

1) *payrolls* 2) *parking lots* 3) *garages* 4) *public buildings and watchmen's rounds* 5) *dating and numbering papers* 6) *mail arrival* 7) *booking and releasing prisoners* 8) *records of sequence handling* 9) *entry of important records and deeds and many others.*

Write, wire or call for complete information.

LATHEM TIME RECORDER COMPANY

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GENTLEMEN: I'd like to hear more about the fabulous NEW Lathem Time Recorder.

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DEPARTMENT_____

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373

Range 373 has symbolized the top quality Police and Fire Department Uniform Fabrics for over 25 years.

It is made in all weights for all climates.

Stock dyed
2 ply
Fast Colors
Uniformity of Shade

Corresponding qualities in worsted whipcords and elastiques; gabardines and tropicals in either 100% worsted or worsted/dacron blends.

TO BE SURE, SPECIFY

FRANKLIN WORSTEDS

for additional information write to—

David E. Singer, Sales Agent
FRANKLIN WORSTED COMPANY
40 East 34th St., New York 16, N. Y.

above a car roof than do present or previous models, yet it has a greater lens area. Overall height of the fixture including a thick soft rubber mounting pad that protects the base is 8¾". Lens height is 5¾", Body diameter is 11".

For additional information, write the R. E. DIETZ Co., 225 WILKINSON ST., SYRACUSE 1, N. Y., or use the Post Card on Page 52. Circle No. 742.

Succeeds Russell

E. Roy Russell has retired as president of the Florence Pipe Foundry and Machine Company and its subsidiary the R. D. Wood Company. He will be succeeded by Warren A. Brown, vice president of the Florence Company since 1954, but will continue to be available to both companies in an advisory and consultive capacity.

The Florence Company, located at Florence, Burlington County, N. J., is a manufacturer of cast iron pipe, fittings, hydrants, valves, hydraulic and other machinery.

Names Representatives

Earl M. Kelly, president of the Process Engineers Division of The Eimco Corp., Salt Lake City 4, Utah, has announced the appointment of the following agents for the division's line of water and sewage treatment equipment:

Atlanta, Ga.—W. D. Taulman & Associates, 415 E. Paces Ferry Rd.;

Charlotte, N. C.—Branch, 1413 Wachovia Bank Bldg.;

Cincinnati, Ohio — Henry P. Thompson Co., 1720 Section Rd.;

Denver, Colo.—Goble and Sampson, 1737 Franklin St.;

Jacksonville, Fla.—Branch, 116 Borders Bldg.;

Indianapolis, Ind.—W. & W. Equipment Co., 9530 Washington Blvd.;

Kansas City, Mo.—Matney & Hanna, 11 E. Gregory Blvd.;

St. Louis, Mo.—Van De Vanter Engineering Co., 2207 Pine St.;

St. Paul, Minn.—Fadden Pump Co., 1551 University Ave.;

Southfield, Mich.—Colley and Schlee, Inc., 24681 Telegraph Rd.;

Troy, N. Y.—Shultz, Forster & Assoc., Inc., Burdett Bldg., P. O. Box 927.

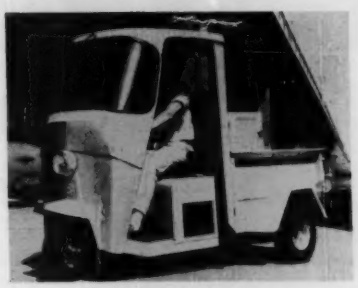
Cushman Improves Trucksters for 1960

Economy of operation, compact size and ruggedness mark the two new 1960 gasoline and electric-powered Trucksters announced by Cushman Motors of Lincoln, Neb.

The 780 Truckster is 48" in width and carries an 800-pound payload at an operating cost of less than one cent per mile. It is powered by the Cushman Husky 4-cycle high compression engine developing 7.95 hp. Major improvements include a new formed channel, automotive-type chassis; a longer, stronger pickup box; a wide front shield for driver protection; top-hinged clutch and brake pedals and rubber mount for the engine. Included among the wide range of body accessories available are a "patrolster" box for police use, a dump box and personnel carrier.

The Electric Truckster can carry

Electric Truckster



780 Truckster

a ½-ton payload plus operator and passenger and has a range of up to 50 miles on a charge. It is well suited for in-plant use and short outside hauls. Standard equipment includes flat bed (45⅝"x61½") with stake racks. Major improvements include a heavier motor and new positive drive that takes the machine fully loaded up steep ramps or grades. The electric model is powered with a choice of lead acid or Edison-type batteries. Also new is a personnel seat and stack rack kit.

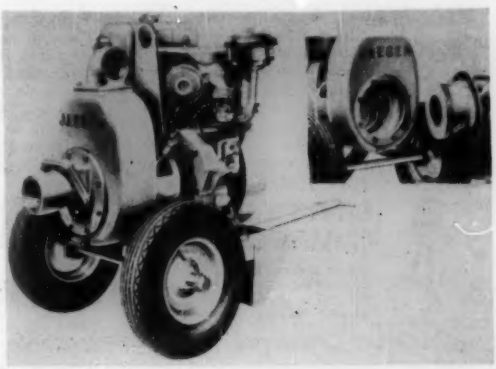
Both the gasoline-driven 780 and the electric Truckster have been designed for service inside the plant as well as on the street.

For additional information, write CUSHMAN MOTORS, 922 N. 21ST. ST., LINCOLN, NEB., or use the Post Card on Page 52. Circle No. 747.

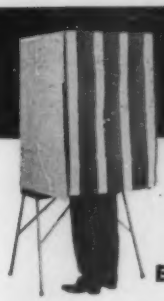
3" Pumps More Accessible, Better Performing

Jaeger's new intermediate and heavy 3" contractors pumps permit quick removal of the entire suction chamber and liner plate without necessitating removal of the volute. Adjustment, rotation or replacement of the liner can be accomplished quickly.

Higher performance offered is demonstrated by the Model 3PN which, with a 4" suction hose, delivers 28,000 gph at 10' lift. Self-



Model 3PN, a 3" contractors pump, offers accessible volute design and stepped-up performance.



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COLLAPSIBLE ELECTION BOOTHS

Packaged for easy use, convenient movement and storage!

Douglas Uni-pack provides 6'1" x 28" x 28" single stall booth yet collapses to suitcase size. Easy to carry and set up by any woman election offical. Ideal for augmenting voting facilities during rush periods. Now being used by all regional offices of National Labor Relations Board.

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★Small investment ★Storage and transportation costs are nil ★No breakdowns and maintenance ★No standing in line by use of plenty of low-cost units ★Only sure way of casting your personal vote

OTHER Douglas ELECTION EQUIPMENT

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- All-Metal Folding Booths
- Collapsible Ballot Boxes
- Collapsible Election Tables
- Rigid Ballot Boxes
- Nested Ballot Boxes
- Voting Booth Lights
- Jury Wheels

For further information, contact your local dealer or write for FREE catalog and prices to:

DOUGLAS MFG. CORP.
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Your budget requires long-term value for every dollar allocated — products must stand up for years. The next time you consider waste receptacles, remember this: United units withstood 100° sizzlers, snowstorms, scuffing and use by a multi-million New York City populace for over 20 years — and simply needed one coat of paint to look brand new! Let sturdy United units give sanitation help to your schools, colleges, institutions, and municipality. Catalog on request.

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DOUBLES length of Filter runs. • REQUIRES only half as much wash water. • KEEPS Filters in service over longer periods. • INCREASES Filter output with better quality effluent. • GIVES better support to synthetic resins. • PROVIDES better removal of fibrous materials, bacteria, micro-organic matter, taste, odor, etc. • IDEAL for industrial acid and alkaline solutions. • EFFECTIVE filtration from entire bed. • LESS coating, caking or balling with mud, lime, iron, or manganese.

IDEAL FOR USE IN EVERY TYPE OF FILTER

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"The Magazine I Read in Bed"

Last month a veteran city official who came up through the ranks of his public works department, introduced his wife to one of our editors like this:

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We were delighted with the introduction. For the past 50 years we have followed the policy of presenting only that information which enables skilled and experienced officials like our friend to run their cities in a more efficient and worthwhile manner.

Whether you read THE AMERICAN CITY in bed, your easy chair, or at the office, you will find it a good investment, both for your city and for yourself.

The American City
470 FOURTH AVENUE
NEW YORK 16, N. Y.

a Buttenheim publication

priming at 10′ lift takes 15 seconds; requires 50 seconds at 25′ suction lift. Thirty pounds lighter than the previous model, the 3 PN weighs 395 pounds complete with pneumatic tired truck. It is powered by a Wisconsin AGND engine having removable aluminum cylinder head, stellite-faced valve and insert and positive valve rotators.

For complete information, write THE JAEGER MACHINE CO., 550 W. SPRING ST., COLUMBUS 16, OHIO, or use the Post Card on Page 52. Circle No. 736.

Cuts Narrow and Shallow Trenches

The TrenchSAW has been introduced as a small, low-cost, simplified trencher designed to rapidly cut a narrow trench of approximately 1″ in width to variable shallow depths as required for the laying of tubing, conduit, and small pipe for water, gas, electrical and telephone service.

It is powered by a portable high-speed, 2-cycle chain saw engine which can easily be detached and used for a chain saw. The digging chain, equipped with specially designed and digging bits, is driven from the chain saw engine through a step-down drive to obtain the proper speed for trenching. The boom is adjustable to obtain the desired depths.

With engine, the TrenchSAW weighs less than 70 pounds. A cast roller lets it ride easily over the terrain. For complete information, write AUBURN MACHINE WORKS, INC., AUBURN, NEB., or use the Post Card on Page 52. Circle No. 760.

Portable Traffic Signal

A recent event in the traffic engineering field was official approval of portable traffic signals as temporary signals. One of the latest of these signals is a signal designed for applications where two-way traffic must be restricted to one lane, feeding in alternate directions, such as in areas where the roadway is being re-surfaced. The device consists of a pair of standard 8⅜″ traffic signal heads (12″ red optional at additional cost), modified to include a reverse-direction indicator, mounted on a sectional mast with a rugged mobile base.

Two modes of operation are provided; manual, for on-the-spot operation, and remote-by-radio, for control from distances up to 400 feet away. The latter operation utilizes the transistorized transmitter, equipped with two channels for control of two separate signals. Write for further details, advising if possible the intended application, to PORTA SIGNAL DIV., DRYOMATIC CORP., ALEXANDRIA, VA., or use the Post Card on Page 52. Circle No. 758.

Small Sewerage Plants Get Better and Better

The sewage purification plant for the little community now can give the big-city plant a better run for its money both in efficiency and cost.

As a result of the development of the Dorr-Oliver Degritting Clarigester, these plants can use mechanical grit removal in the same tank with a conventional Clarifier. This new "Degritting" device is available on all sizes of existing Dorr Clarifiers Type A, and Clarigesters between 20′ and 40′ diameter. In either case, it will remove troublesome grit from the raw sewage without the need for costly separate grit-handling facilities.

Further modification to the basic Clarigester design includes the Dorr Duo-Clarigester, providing primary and secondary sedimentation, as well as sludge digestion, in a single tank, and the Dorr-Oliver CompleTreator which provides complete sewage treatment in a single tank.

A new bulletin covers in detail the Degritting Clarigester and Clarigester, and also includes brief descriptions of the CompleTreator and Duo-Clarigester. The unit which is most economical will depend on such local conditions as population, available space, degree of treatment required, etc. For a copy, write DORR - OLIVER INC., 77 HAVEMEYER LANE, STAMFORD, CONN., or use the Post Card on Page 52. Circle No. 752.

Keeps Walks, Drives Ice-Free and Safe

This self-propelled, power-driven Salt 'n Sand Spreader attachment spreads from a 4′ to a 25′ width, and a length of 1,050′ in one loading. It will spread salt, sand, calcium chloride or any other combination.

Controls are at the operator's fingertips for maximum efficiency. The hopper rests on a carriage that the manufacturer states will have other useful purposes. The unit is powered by a 6.6-hp Gravely tractor. For additional information on this snow removal tool, write GRAVELY TRACTORS, INC., P. O. Box 636-K, DUNBAR, W. VA., or use the Post Card on Page 52. Circle No. 741.

Merger Voted

A move of major importance in the steel fabricating field is the merger of the Pittsburgh - Des Moines Steel Co. and Hammond Iron Works of Warren, Pa.

The combined company, to be known as Pittsburgh-Des Moines Steel Company, will specialize in metal fabrication and construction and will continue to manufacture the products of Hammond Iron Works. It will have 12 plants strategically located throughout the nation, thereby comprising the greatest geographical distribution of fabricating facilities in the country, and it will be in an advantageous position to serve all parts of the United States and the export market.

As a result of the merger, Pitts-

15,000 Patterns

ON HAND FOR GRAY AND DUCTILE IRON

Construction Castings

WITH LARGE STOCKS MAINTAINED FOR PROMPT SHIPMENT ANYWHERE

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YOU CAN BE PENNY-WISE AND SIGN-FOOLISH.....

Be cautious of signs that look like a good buy on the "flat" surface. Only embossed traffic-control signs and street-name assemblies by Miro-Flex have the durability to withstand the elements and abuse year after year. Miro-Flex signs are made on zinc-coated, Bonderized steel with baked-on enamel finish. Embossing gives them extra strength, rigidity, and legibility. A complete line of uniform signs conforming to Bureau of Public Roads standards and custom-designed signs are available. Send for free catalog and name of nearest source.

Embossed **MIRO-FLEX SIGNS LAST and LAST...**

THE MIRO-FLEX CO., INC.

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Standard Traffic Signs Available for Immediate Delivery at Northeastern Warehouse

Koontz Equipment Corporation, 325 Ohio River Blvd., Emsworth, Pittsburgh 2, Pennsylvania

burgh-Des Moines will also acquire Hammond, Latino Americana S. A., the foreign affiliate of Hammond Iron Works which has been engaged in the construction of field storage tanks and steel plate-work in many foreign countries.

The Pittsburgh-Des Moines Steel Company, which had its origin in 1893 at Des Moines, Ia., specializes in the design, fabrication and construction of such products as elevated water storage tanks, reservoirs, pressure vessels for liquids and gases, process tanks, steel grandstands, wind tunnels, structural steel buildings and bridges. Hammond Iron Works, which was founded in Warren, Pa. in 1900, has been engaged in designing and building tanks and vessels for the petroleum and petro-chemical industries and special vessels for the chemical, food processing, mining, and paper and pulp industries.

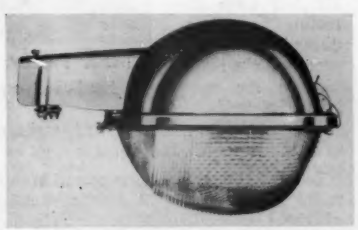
At a meeting of the board of directors of the combined companies, the following officers were elected: J. E. Jackson, chairman of the board; W. R. Jackson, president; R. Y. Kopf, vice president; T. W. Fauntleroy, vice president; C. A. Fegtly, vice president; R. E. Kramer, vice president; T. G. Morris, secretary-treasurer; M. P. Cook, assistant secretary.

The executive committee is composed of J. E. Jackson, W. R. Jackson and R. Y. Kopf. The administrative offices of the combined company will be in Pittsburgh, Pa.

Lightweight Mercury Luminaire

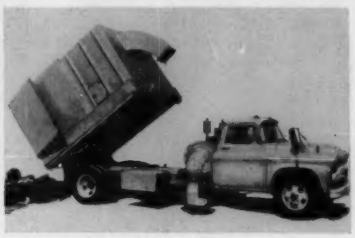
The Line 2A1, which augments the mercury line of street lighting fixtures available from Line Material Industries, is designed for streets, highways and other high-level lighting areas. It is equipped with a fixed mogul socket for multiple service and accommodates lamps rated at 250, 400, or 425 watts. IES type II, III or IV light distribution is achieved with a one-piece heat-resistant glass refractor.

A heavy gauge aluminum housing also serves as a reflector. Aluminum slip-fitter casting for 1¼" or 2" pipe is adjustable from horizontal to 10° with non-corrosive screws. A neoprene gasket provides a seal against water, bugs and dust. For additional information, write Line Material Industries, McGraw-Edison Co., Milwaukee 1, Wis., or use the Post Card on Page 52. Circle No. 739.



The reflecting surface of the Line 2A1 is polished and ALZAK processed to provide maximum reflectivity.

Dustless Street Cleaning



This is the Baughman Street Cleaner. Its vapor spray system moistens all dust, dirt and debris as they are sucked from the street by a powerful vacuum system. By means of this controlled moisture, introduced into the blower, dirt becomes heavy and coarse, losing its powdery consistency almost immediately, and when carried by the ductwork into the truck body it stays there.

The heavy-duty vacuum unit is powerful and thorough. It is powered by a husky 70-hp air-cooled auxiliary engine, so that the resulting vacuum has plenty of pull—and cleans an 8' strip as well as the gutter area.

An extra-large capacity body implies more hours on the job, fewer trips to the dumping area. A single-ram hoist elevates the body to a 45° angle at time of discharge for faster, cleaner operation. When the body is raised, the body duct separates from the blower unit and facilitates clean out. Handy cab controls operate the vacuum unit, raising and lowering as needed, as well as the hoist for discharging. Additional information and illustrated literature can be obtained from Baughman Manufacturing Co., 217 Shipman Rd., Jerseyville, Ill., or use the Post Card on Page 52. Circle No. 751.

Payload Upped 25% With New Refuse Body

Hercules Galion Products, Inc., Galion, Ohio reports that a new Hydro E-Z Pack refuse truck body, constructed of Republic "50" high strength steel increases removal payloads 25%, combats corrosion and resists the 38-ton force of a hydraulic refuse crusher.

The high-strength steel unit is said to be lighter than carbon steel counterparts, and so can be mounted on a 2-ton truck chasis, in contrast to other removal units which often require a 3- or 3½-ton chassis. The weight saved, in this instance, allows for larger payloads, fewer trips to the dumping area and substantial savings to the municipal hauler.

Tree limbs, cans, crates and other refuse are pushed to the rear of the Hydro E-Z Pack by a hydraulic blade and crushed against the unit tailgate—without noticeable abrasion. Each unit is completely enclosed, heavily reinforced and all-welded. Republic Steel Co., which makes Republic "50" steel, reports that this steel provides structural strength, in terms of yield point, about 50% greater than carbon steel. It is said to give corrosion resistance superior to that of carbon steel.

For additional information, write Hercules Galion Products, Inc., Galion, Ohio, or use the Post Card on Page 52. Circle No. 748.

Fabricated from Republic "50" steel, this Hydro E-Z Pack refuse truck body offers great strength with less weight, permitting substantially greater payloads.

ABOUT PEOPLE

Wallace T. Miller, research engineer for the **Cast Iron Pipe Research Association,** has been appointed assistant managing director of the Association, which includes the nation's leading manufacturers of pipe used in water and gas distribution systems. As assistant to Thomas F. Wolfe, CIPRA managing director, Mr. Miller has been active in supervising the Association's current nationwide campaign to arouse and organize public support for improved municipal water treatment and distribution facilities.

W. T. Miller

In his newly-created position as manager, sales development, at **The Frank G. Hough Co.,** Libertyville, Ill., David D. Hunsaker will be responsible for sales engineering, training aids, product knowledge and merchandising programs.

John Vilven, who has been named general sales manager for **Massey-Ferguson Industrial Division,** Wichita, Kans., by Charles F. Hill, general manager, will head the division's over-all sales efforts, reporting directly to Cornelius "Corny" Whetstone, the division's general marketing manager. Mr. Vilven had been serving the division as western regional industrial sales manager. Prior to that he was regional manager in the western regions for Midwestern Industries, Inc., whose patents and assets were purchased in 1957 by Massey-Harris-Ferguson, Inc. to become the Massey-Ferguson Industrial Division.

J. Vilven

Newton Zahniser has been named sales manager of **Superior Meter Co.,** a subsidiary of the Gas Meter Division of Neptune Meter Co.

Tom Brockway is now district sales representative of the Trojan Division of **The Yale & Towne Manufacturing Company** for Texas, Oklahoma, Kansas, and western Missouri.

Earl B. Cutter, Jr., recently named southern district manager of **American Meter Company's** southwest division, will headquarter in Dallas, Texas.

The appointment of Conrad L. Daniels as works manager of the Rockford, Ill., plant of the **J. I. Case Company** has just been announced by Frank Palermo, vice president in charge of manufacturing. Lawrence H. Hodges, former works manager, has been promoted to a top position in central engineering at the company's headquarters in Racine, Wis.

Aero Service Corp. with headquarters in Philadelphia, Pa., has announced the election of George Strawbridge to its board of directors. Mr. Strawbridge has purchased a majority interest in the company and will participate in its management as assistant to the president. Virgil Kauffman continues as president and operating head.

Hugh E. Mulholland, C. E., has joined the staff of **Daniel, Mann, Johnson, & Mendenhall,** architects and engineers, Los Angeles, Calif. According to Irvan F. Mendenhall, partner-in-charge of engineering for the firm, Mr. Mulholland will serve as special consultant to the firm's civil engineering and public works clients.

As research coordinator of **Republic Flow Meters Co.,** a subsidiary of Rockwell Mfg. Co., Pittsburgh 8, Pa., Benjamin L. Binford will coordinate the development of instruments controls, valve operators and allied equipment with other divisions of the parent company.

Worthington Corporation has announced a major organizational change at its Buffalo, N. Y., Compressor and Engine Division. The former engine sales department has been separated into two groups: power engine sales and engine compressor sales, both reporting to E. A. Murray, manager of sales & service. Alfred M. Boehm has been named manager of power engine sales and Howard C. Barten was appointed manager of engine compressor sales.

The appointment of Andrew J. Cox as administrative assistant to the general manager of its construction machinery section has been announced by **Chain Belt Co.,** Milwaukee 1, Wis., a leading producer of equipment for the concrete road-building, general construction and ready-mix industries. Its ready mix line includes bins and batching plants, central mixing plants and truck-mounted concrete mixers.

A. J. Cox

Division appointments announced recently by **The White Motor Co.,** Springfield, Ohio are those of Bernard C. Ball and William L. Peterson. Mr. Ball has been named advertising and sales promotion manager for the company's Diesel Engine Division; Mr. Peterson, manager of the Philadelphia branch of the Truck Division.

Scott C. Ashton has been appointed New York district sales manager for Brown Trailer Division, **Clark Equipment Co.,** according to R. Gordon Thorpe, division general sales manager. Mr. Ashton will be headquartered in the division's Linden, N. J. branch office and will be responsible for all division operations in the New York and New England areas.

S. C. Ashton

Other personnel changes reported concern E. R. Baetzel, named marketing manager of the Division's newly formed general sales section, and Milton "Red" Kratzer, appointed trailer manager for the Division.

J. T. Skinner has been appointed sales manager, Deerfield Products, Construction Machinery Division, **Allis - Chalmers Mfg. Co.** He was sales manager for Tractomotive at the time Allis-Chalmers acquired it in June and continued in that capacity when Tractomotive became the Allis-Chalmers Deerfield Works. Products manufactured at the Deerfield works include a line of rubber-tired loaders, tractor shovels, sidebooms and other tractor and grader attachments.

J. T. Skinner

The appointment of Martin J. Tuckett as general sales manager has been announced by the **Greenlee Tool Co.,** Rockford, Ill. Mr. Tuckett joined the firm in 1957 as assistant to the vice president in charge of sales. He has been directing merchandising and sales promotion activities in the company's hardware and industrial fields.

M. J. Tuckett

Delbert Wilson was named assistant sales manager in the same move.

James S. Boggs has been named branch manager of the new West District office of **The Union Metal Mfg. Co.,** Canton, Ohio. Mr. Boggs will maintain headquarters at 7224 Village Drive, Prairie

(*Continued on page* 204)

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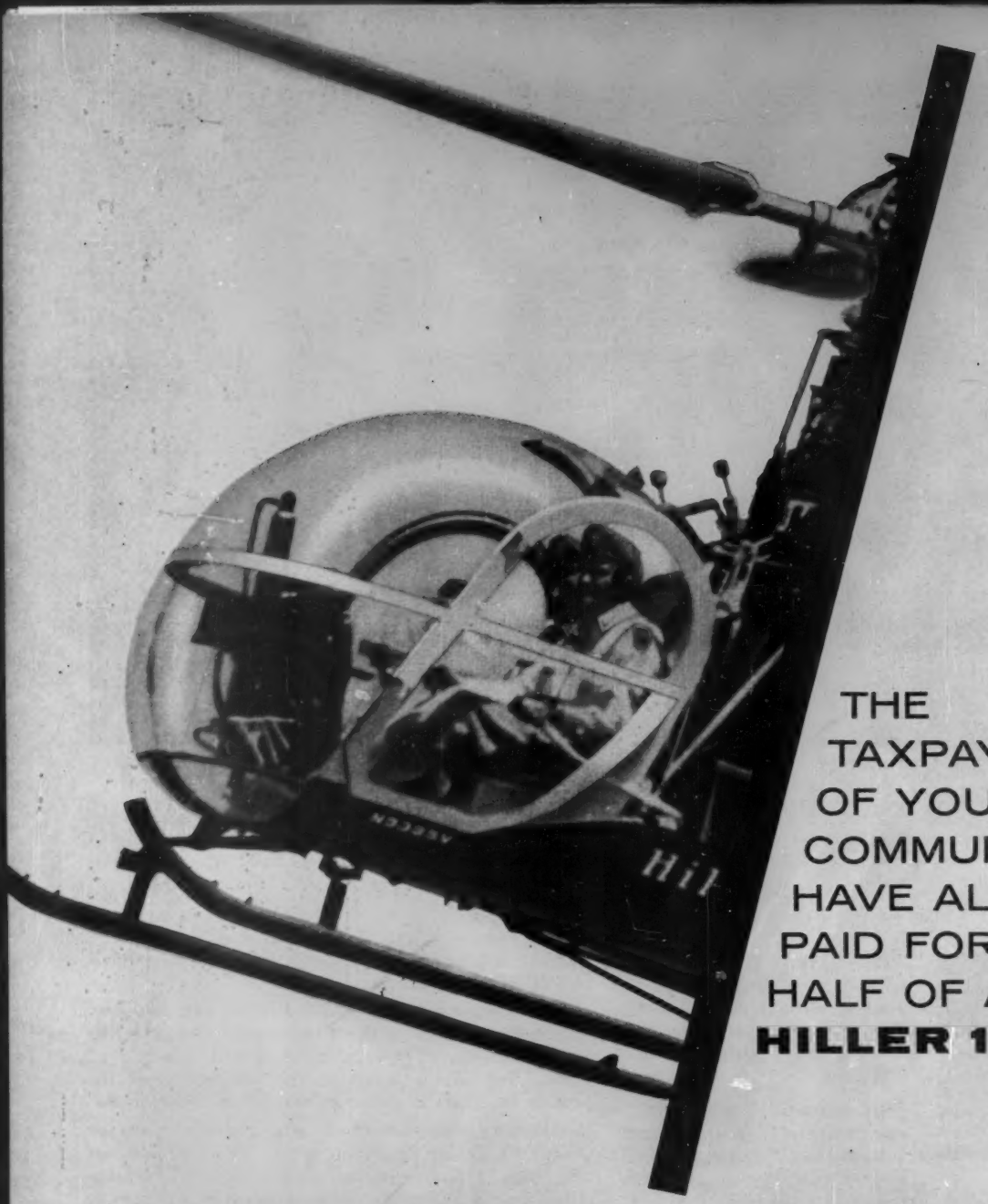

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About People

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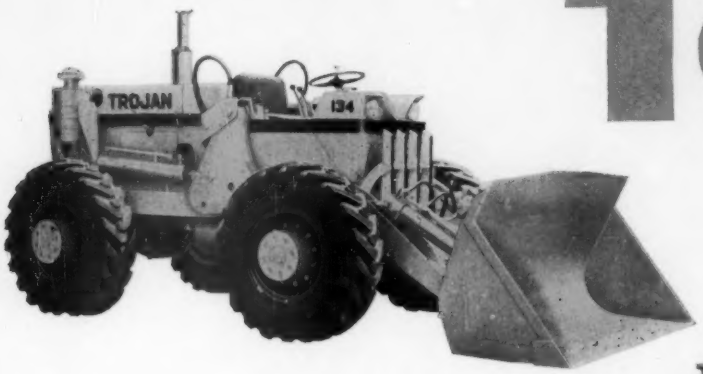

MODEL 134
8,000 LB. CAPACITY

MODEL 164
10,000 LB. CAPACITY

TROJAN makes what it takes for any job!

Now you can bid any size job—secure in the knowledge that this complete Trojan line fits any and all applications. With the introduction of the 134 and 164, both one-machine owners and fleet operators alike may choose from a full working range . . . 1 to 4 cubic yards in lifting capacities from 5,000 to 24,000 lbs. . . . making available to every operator a model precisely matched to his needs . . . Add up the many Trojan benefits and features, you will then see why any one of these models could mean extra profits from the very first working day . . . Put yourself ahead—ask your distributor to demonstrate the Trojan model of your choice.

TROJAN 134

This 1⅓ yard machine, with an 8′8″ dump height, 2′5″ forward reach and gas or diesel power.

TROJAN 164

Here is a 1⅔ yard loader with a 10,000 lb. lifting capacity, 8′6″ dump height, 2′9″ forward reach and choice of gas or diesel power.

AD NO. 44-42

The Trojan line includes models with lifting capacities from 5,000 to 24,000 lbs. and bucket capacities from 1 to 4 cu. yds.

THE YALE & TOWNE MANUFACTURING COMPANY
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TROJAN®
TRACTOR SHOVELS
YALE & TOWNE

New Tractor Shovel brings new economies to small town

Michigan introduces Model 55A, early purchaser reports it does many jobs previously skipped (or handled by $10/hr. rental units)

Like many small communities, the Village of Pewaukee, Wisconsin, for years handled loading and clean-up chores with a farm-type tractor and various pieces of rental equipment. As may be expected, costs were high. But so too, reasoned the Village Board, would be the initial expense of buying a bigger machine . . . especially to a town of only 2000 people.

Then last spring, Aring Equipment Co, Michigan Distributor in Milwaukee, showed the new Michigan 1 yard Model 55A. Price, with trade-in, under $10,000. Back-hoe, snow plow, sweeper, a lot of other attachments could be added later.

Everyone was impressed. It was easy to figure how this unit's four-wheel-drive, speed and versatility could cut expenses. Also, how it might handle the many jobs previously not done at all or, at best, done inefficiently.

"Since then," says Gary Boyce, Pewaukee Supt of Public Works, "we've used our Michigan *for everything*." For instance . . .

Saves $50 weekly rental at the sanitary landfill. The Village makes a monthly pick-up; between times, villagers dump their own trash and rubbish. Once a week a rented crawler would clean up; between times the dump was messy. Now, the Michigan, with 26 mph mobility, runs out every day or two. Clean-up is done quickly, the old $10 per hour crawler rental expense is eliminated.

Cleans lakefront. Located on a popular resort lake, Pewaukee has the problem of keeping its beach clean. Lake residents and motor boats cut weeds. Prevailing winds blow them to shore . . . sometimes piling them a foot thick. Previously, each cleanup took 15 man hours . . . "hand hours" since the farm tractor couldn't work in sand. Now, the Michigan wades in hub-deep, shoves weeds onto shore, loads them in truck. In *one hour* the job's done.

Stockpile-loads sand, salt, blacktop, stone. The power steer, power-shift Model 55A with 1 yd bucket heaps a 5 yd truck in five passes, 2 to 2½ minutes. Pewaukee's old farm-type loader took 5 to 7 minutes for the same job . . . *if* the material wasn't frozen.

Takes place of truck. When trucks are busy, the Michigan may carry its own load a block or a mile or more. Street patching is a good example. Here, the 26 mph Model 55A carries a yard of blacktop down the street —stops at potholes—operator or helper hand-shovels and packs in materials as needed.

Tree trimming. Due to inadequate equipment, this once was a chore rarely attempted. Now, the Michigan, used as a fast-moving lift-truck, raises a man up to 8 feet off the ground for trimming with chain saw or 18 foot pruner. Thus street lights have been made more efficient . . . traffic hazards removed.

These are but a few of the jobs where the 66½ hp Model 55A is saving time, trouble, and money for the Village of Pewaukee. Let us show you, first-hand, how it can do the same for you!

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

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